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Popular Government

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Helping Communities Compete in the New Economy

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How to Slim Your Waste

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E-Government in Rural North Carolina

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Popular Government

James Madison and other leaders in the American Revolution employed the term "popular government" to signify the ideal of a democratic, or "popular," government—a government, as Abraham Lincoln later put it, of the people, by the people, and for the people. In that spirit *Popular Government* offers research and analysis on state and local government in North Carolina and other issues of public concern. For, as Madison said, "A people who mean to be their own governors must arm themselves with the power which knowledge gives."

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Established in 1931, the Institute of Government provides training, advisory, and research services to public officials and others interested in the operation of state and local government in North Carolina. The Institute and the university's Master of Public Administration Program are the core activities of the School of Government at The University of North Carolina at Chapel Hill.

Each year approximately 14,000 city, county, and state officials attend one or more of the 230 classes, seminars, and conferences offered by the Institute. Faculty members annually publish up to fifty books, bulletins, and other reference works related to state and local government. Each day that the General Assembly is in session, the Institute's *Daily Bulletin*, available in print and electronically, reports on the day's activities for members of the legislature and others who need to follow the course of legislation. An extensive Web site (http://iog.unc.edu/) provides access to publications and faculty research, course listings, program and service information, and links to other useful sites related to government.

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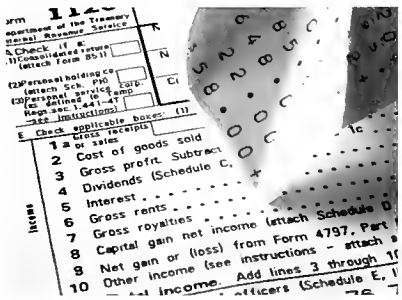

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North Carolina Responds to Bioterrorism

Sources of Information on Bioterrorism

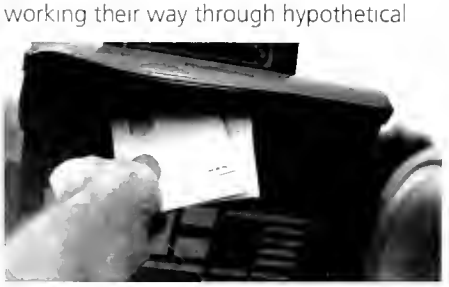
- Centers for Disease Control and Prevention, bioterrorism Web page, www.bt.cdc.gov
- North Carolina Division of Public Health, information on anthrax, www.epi.state.nc.us/epi/anthrax.html
- UNC–Chapel Hill School of Public Health, North Carolina Center for Public Health Preparedness, www.sph.unc.edu/bioterrorism/
- *Responding to Biological Threats: The Public Health System's Communicable Disease Authority*, by Jill Moore (Institute of Government, Health Law Bulletin No. 78), available through the Institute's Publications Sales Office, (919) 966-4119, or on the Internet at www.iogpubs.iog.unc.edu

When the first case of inhalational anthrax in the United States in more than twenty years was diagnosed in a Florida man last fall, North Carolina public health officials were notified almost immediately. The man, who subsequently died, had been traveling in North Carolina in late September when he became sick. It therefore was considered likely that he had been exposed to the deadly bacteria while he was in this state.

North Carolina officials learned of the diagnosis in the late afternoon on Thursday, October 4. By midnight, a large-scale information-gathering process known as public health surveillance was well under way. Public health workers in four counties pored over hospital records, looking for patients with symptoms that might suggest inhalational anthrax. Local health directors throughout the state notified hospitals and health care providers to be on the lookout for additional cases. They also provided information to aid physicians and laboratory workers in recognizing anthrax, a disease that occurs naturally so rarely that most clinicians have never seen it.

By mid-October the country was aware that anthrax was being spread deliberately through the mail. The Florida man's exposure had been linked to his workplace, and no one else with a North Carolina connection had become sick, so the intensive surveillance efforts in this state ended.

Public health and other government workers continued to work on anthrax and other bioterrorism issues, though. Throughout the state, local and regional interagency teams formed to plan a response, as a wary public referred hundreds of suspicious letters and packages to police, the fire department, the health department, and other emergency services. Government officials participated in "tabletop" exercises, working their way through hypothetical terrorist releases of smallpox, nerve gases, and other biological and chemical agents. The General Assembly enacted several new laws on bioterrorism. One requires laboratories and researchers who use certain biological agents in their work to register with the state Department of Health and Human Services. Another provides stiff criminal penalties for people who use biological or chemical agents as weapons.



Preparation to respond to bioterrorism began in the state's Division of Public Health several years ago, resulting in a draft response plan released in June 2001. The UNC–Chapel Hill School of Public Health also has been at the forefront of response planning, through its North Carolina Center for Public Health Preparedness, which was established in 2000 to prepare the public health workforce to respond to bioterrorism and other health threats. Within days of the September 11 attacks, the division and the center had marshaled existing expertise and resources for a series of seminars and conferences on bioterrorism, geared primarily toward the government officials who must respond to such events and the health care workers who may be the first to recognize that a terrorist act is causing disease outbreaks.

Nationally the anthrax letters have prompted a review of the legal authority of public health officials to control the spread of diseases that may be caused by terrorist attacks. The federal Centers for Disease Control and Prevention commissioned the drafting of the Model State Emergency Health Powers Act to provide a template for new state laws establishing or clarifying the role and the power of public health systems in emergencies. The model act is available on the Internet at www.publichealthlaw.net.

The Institute of Government will provide updated information on the legal issues associated with bioterrorism through *Popular Government* and other publications. For more information, contact Jill Moore, (919) 966-4442 or moore@iogmail.iog.unc.edu, or consult the sources in the sidebar on this page.

Leaders Visit Mexico to Study Issues Affecting Local Immigrants

In March 2001, Thomas Thornburg, the Institute of Government's associate director for programs, traveled to Mexico with public officials, Latino leaders, and others from Durham, Orange, and Wake counties to learn more about issues affecting Latinos living in North Carolina.

The group was participating in the Latino Initiative, which in recent years has sent several groups of North Carolinians to the country on the southern border of the United States: foundation and nonprofit leaders in 1998; representatives from Chatham County and state government in 2000; and a delegation from Harnett, Johnston, and Lee counties in fall 2001. The sponsor of the initiative is the University of North Carolina's Center for International Understanding (www.ga.unc.edu/NCCIU/latinoinit.html).

In February 2002 the Latino Initiative will bring twenty-five leaders from Mexico City and the states of Guanajuato, Oaxaca, and Puebla to North Carolina. As part of their visit, the leaders will meet with Thornburg and with Gordon Whitaker and Margaret Henderson of the Institute, who specialize in relationships between local governments and nonprofit organizations.

Almost two hundred community leaders from across North Carolina will have participated in the center's outreach program by the end of 2003. The center is organizing programs for two more groups in 2002: a delegation from Buncombe, Catawba, and Henderson counties, who will visit Mexico City and the state of Michoacan; and one from Duplin, Sampson, and Wayne counties, who will visit Mexico City and the state of Oaxaca.

A group of educators also is scheduled to go in 2002, building on earlier center-sponsored trips by classroom teachers, administrators, and board members to learn about educational issues facing immigrants to North Carolina.

For more information about the Latino Initiative, contact Thornburg, (919) 966-4377 or thornburg@iogmail.iog.unc.edu.

Cumberland Opts for County-wide Planning

In November 2001, all ten elected boards in Cumberland County agreed to collaborate in designing and implementing countywide planning. As a result, representatives of the county, its school system, and all its municipalities soon will sit down at one table and work together on issues that cut across political jurisdictions and geographic boundaries.

The boards made this decision after much conversation with business, community, and other government leaders across summer and fall 2001, facilitated by Institute of Government faculty. The period leading to the boards' decision constituted the first phase of the project. In the next phase, the boards will engage business, military, and community leaders in planning. All issues are open for discussion—from economic development to schools to parks to public health—and all decisions will be made collectively by the representatives of the participating groups.

For more information about comprehensive planning in Cumberland County and collaborative planning in general, contact Phil Boyle at (919) 962-9594 or boyle@iogmail.iog unc.edu

Participating Organizations

Elected Boards
Cumberland County Board of Commissioners
Cumberland County Board of Education
Falcon Town Council
Fayetteville City Council
Godwin Town Council
Hope Mills Town Council
Linden Town Council
Spring Lake Town Council
Stedman Town Council
Wade Town Council

Other Organizations
City–County Liaison Committee
Cumberland County Joint Planning Board
Downtown Development Corporation
Fayetteville Area Economic Development Corporation
Fayetteville Chamber of Commerce
Fayetteville Planning Commission
Mayor's Committee on Electric Restructuring (Fayetteville)
Public Works Commission

Organizations Teach Consensus-Building

More and more stakeholder groups are helping form policy, coordinate services for citizens, and tackle difficult community problems. Sometimes everyone in the group must work together to implement a decision, so decision making by consensus is the appropriate way to proceed. Even when decision making by consensus is not possible, a government entity may need or want robust involvement from interested groups.

Recently, to help stakeholder groups understand consensus-building and other models of active participation, the Institute of Government, North Carolina State University's Natural Resources Leadership Institute, the Mediation Network of North Carolina, and the Orange County Dispute Settlement Center sponsored two conferences on the theme "Improving Public Decision Making through Participation: Leadership, Governance, and Community." Offered August 29 in Greenville and September 13 in Hickory, they attracted more than 300 people. Conference organizers helped participants new to consensus-building recognize appropriate situations for using consensus, showed them how to design a process for achieving consensus, and demonstrated group-process tools to make collaboration work. Specialized topics included understanding legal standards affecting collaboration, working with the media, and using facilitators and mediators.

A tangible product of the conference was a compilation of resources on participation, collaboration, and related topics. The resource guide identifies fourteen North Carolina organizations that can provide advice, training, reports, and other assistance to groups seeking effective public participation. For example, the newly formed North Carolina Community Solutions Network provides support for a variety of community-building efforts. The resource guide includes Web sites and citations for manuals, reports, guidebooks, and other documents on civic involvement, community development, community building, models for engaging community groups in dialogue, and facilitating groups. It is available at the Institute's NCINFO Web site, www.iog.unc.edu/programs/dispute/resourcemats.htm.

For more information, contact John Stephens at (919) 962-5190 or stephens@iogmail.iog.unc.edu.

Institutes to Offer Training in New Medical Privacy Rule

To assist local governments in complying with a new federal rule on the privacy of health information, the Institute of Government and the North Carolina Institute for Public Health will offer a comprehensive training program beginning in May 2002. Agencies have only until April 2003 to comply with the rule, which is complex and creates a number of new legal obligations.

The federal Health Insurance Portability and Accountability Act of 1996 (HIPAA) requires public and private health care providers, health plans, and health care clearinghouses that transmit health information electronically to comply with a detailed set of rules on managing information. One of those rules provides for a comprehensive scheme to protect the privacy of health information identifying an individual.

To achieve compliance, agencies must assess their current privacy policies and practices to determine where changes or additions must be made. They also must review any forms that authorize uses or disclosures of information. In numerous instances they will have to develop new forms. Many agencies will have to change some business practices as well.

The rule also creates a new set of patients' rights that must be addressed by policies and procedures. For example, it requires agencies covered by HIPAA to permit patients to inspect their personal health information, to obtain copies of it, and to request amendments to correct inaccuracies. (A thorough summary of the rule's requirements will appear in the Spring 2002 issue of *Popular Government*.)

Local health departments and area mental health agencies in North Carolina are covered by HIPAA. Social services and other local agencies may be covered as well, depending on the types of services they provide. Many agencies that are not covered will nevertheless be affected because they obtain health information from agencies that are covered.

The training program of the two institutes will begin in May 2002 with an intensive seminar, to be held in several locations across North Carolina. The seminar will provide a detailed introduction to the new rule and other laws affecting medical privacy. Participants will receive extensive outlines of the key legal issues facing local government agencies and other materials designed to help them develop new policies and forms that comply with the law and meet their agencies' needs.

Following the seminar, participants will have access to a medical-privacy Web site for legal updates and answers to frequently asked questions. Follow-up videoconferences in fall 2002 and spring 2003 will round out the program. The videoconferences will offer further exploration of selected topics, legal updates, and an opportunity for questions and discussion.

The program is intended primarily for privacy officers in local government agencies that are covered or affected by HIPAA. It also will be appropriate for the directors of those agencies, county attorneys, county managers, and others who work for or with covered agencies.

Registration information will be sent to all local health departments, area mental health agencies, county social services departments, county attorneys, and county managers in early spring 2002. It also will be available on the UNC–Chapel Hill School of Public Health's Web page, www.sph.unc.edu/oce/.

For more information, contact Jill Moore, (919) 966-4442 or moore@iogmail.iog.unc.edu, or Aimee Wall, (919) 843-4957 or wall@iogmail.iog.unc.edu.

COVER ARTICLE

Enhancing the Competitiveness of North Carolina Communities

James H. Johnson, Jr.

To thrive and prosper in the new economy, North Carolina municipalities will have to adapt to the federal government's recent policy shift toward letting free enterprise solve pressing urban and rural problems.

Providing businesses with access to high-speed communication links like fiber optic cable is key to communities competing successfully in the economy of the twenty-first century.

KEITH GREEN / NEWS & OBSERVER

Several recent socioeconomic and demographic trends threaten the future health and competitiveness of North Carolina and other states.[1] Despite enormous economic growth and wealth generation, the gap between the haves and the have-nots in North Carolina widened during the 1990s. This continues a three-decade national trend of growing inequality.[2]

Preliminary analyses of the 2000 census results reveal that this trend is undergirded by an increasing "balkanization" of the U.S. population (that is, an increasing division of Americans into smaller groups).[3] Over the past decade, the state and the nation have both become racially and ethnically more diverse, but only as a whole. Confirming the findings of earlier research, the 2000 census indicates that non-Hispanic whites are increasingly concentrated in economically prosperous communities, while blacks and other people of color are clustered for the most part in declining or economically marginal communities.[4]

These two developments—growing inequality and population balkanization—have had a devastating impact on the youth of North Carolina and the nation. Segregation along racial lines in the public schools has worsened during the 1990s, paralleling growing disparities in black-white achievement.[5]

The two developments also have exacerbated race relations in the nation and the state. Throughout the 1990s—especially in U.S. cities that were left behind in the economic boom but experienced population growth fueled by immigration—tensions, conflicts, and confrontations with racial or ethnic overtones have triggered protest demonstrations and civil unrest.[6] In North Carolina, which became a major magnet for immigration during the 1990s, the schisms to date have been limited to isolated incidents of violence against immigrant newcomers and hostile verbal exchanges between them and the state's long-term white and black residents over access to housing, jobs, and other scarce resources. However, if history serves as an accurate barometer, the situation might worsen in the current statewide economic downturn.[7]

To thrive and prosper in the new economy, North Carolina municipalities, particularly those with substantial populations in economic distress, will have to adapt to the federal government's recent policy shift toward letting free enterprise solve pressing urban and rural problems.[8] They also will have to adjust to the philanthropic community's increasing preference for funding entrepreneurship and socially responsible undertakings.[9]

In view of these dramatic policy shifts, I propose in this article a conceptual model for understanding, evaluating, and enhancing community health and competitiveness in the twenty-first century's knowledge-based economy. The model identifies six types of "community capital"—*polity, physical, finan-*

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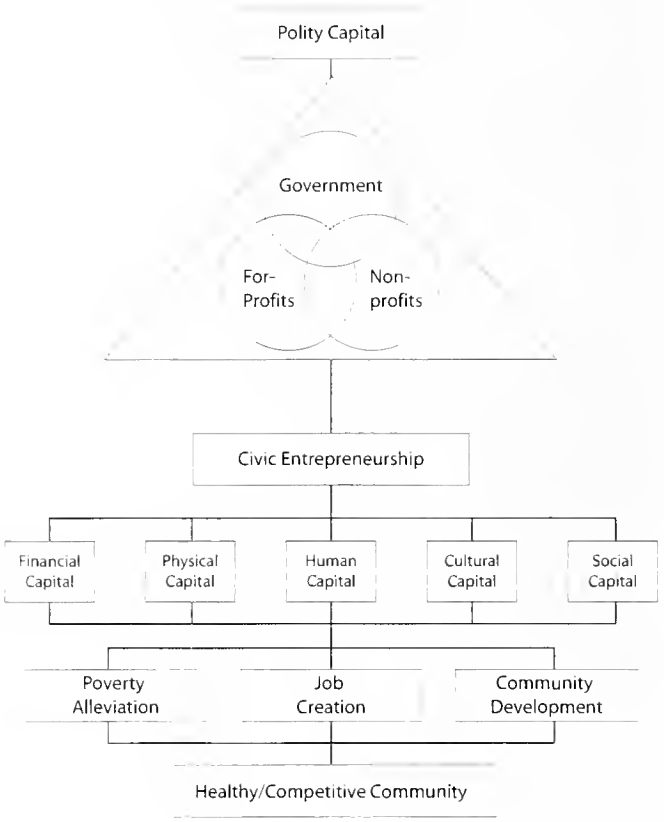
cial, *human*, *cultural*, and *social*—that North Carolina communities will have to develop in order to thrive locally in the global economy.[10]

In the following sections, I describe the six sources of capital and present manifestations of each in selected highly competitive communities of the new economy. I also discuss what North Carolina municipalities must do to develop the full complement of capital assets that are known to exist in highly competitive communities. Finally, I outline a three-step action plan that North Carolina municipal leaders can pursue to improve the health and the competitiveness of their communities in the marketplace of the new economy.

Figure 1. **A Civic Entrepreneurship Model for Enhancing Community Health and Competitiveness**



Description of the Model

The proposed model for enhancing communities' health and competitiveness (see Figure 1) is predicated on the ability of municipal government leaders to leverage their polity capital to forge mutually beneficial entrepreneurial relationships with for-profit (business) and nonprofit institutions. From that basis they can aggregate the other five sources of community capital to foster strategies for reducing poverty, creating jobs, and developing a healthy and economically competitive community. I discuss each component of the model in detail in the following sections.

Polity Capital

To compete in the new economy, North Carolina communities, especially those that are severely distressed, may need to re-engineer how they go about developing their polity capital. For present purposes, "polity capital" is the resources and the tools that local governments and other institutions have at their disposal to improve or enhance the health, the socioeconomic well-being, and the overall competitiveness of their community in the global marketplace.[11]

In many communities, especially those that have been left behind in the current economic boom, two elements of polity capital, the business climate and regulatory structures, often deter community stakeholders from pursuing innovative strategic alliances and entrepreneurial or business-oriented approaches that can generate revenue. Such approaches can, in turn, be used to resolve those communities' seemingly intractable social and economic problems.[12]

For example, Philadelphia's tax structure is driving high-tech entrepreneurs to the suburbs.[13] Commenting on the problem, the president of a Philadelphia e-commerce business organization said,

> *[T]he tax structure, I think, has caused a lot of business owners to think more seriously about where they locate, and a lot have moved to the suburbs. . . . [I]nformation technology in general is all intellectual capital. And intellectual capital has feet—it's easy to move.*[14]

When asked to identify the most important barriers to success for the technology community in Philadelphia, 68 percent of 100 people surveyed at a technology conference in that city "mentioned city taxes, twice as many as the next factor."[15] More specifically, the conference attendees indicated that the city's taxes on wages, stock options, and gross receipts were deterring companies from locating in the city.[16]

To secure the resources needed to compete, new-economy communities have moved toward a "network governance model—a coalition of business, government, and community leaders who skillfully blend new business models of venture capital and networking with the job of solving public problems."[17] In such cities the local government actively and aggressively pursues strategic alliances with businesses and nonprofits—domestically and internationally—that will lead to the development of cultural ties and profit-centered activities. These ties and activities will, in turn, generate revenue, create jobs, and enhance the cities' overall image and attractiveness as places to live and do business.[18]

In such strategic alliances, the government employs sound and socially responsible business principles to enhance the efficiency and the effectiveness of its operations, while creating policies that encourage others to act responsibly.[19] For-profit entities act in a socially and environmentally responsible manner while continuing to operate in the best interest of shareholders. Nonprofits strive to create social-purpose ventures that address pressing local needs and the financial needs of their organizations.[20]

Communities and organizations that embrace such approaches are engaging in "civic entrepreneurship."[21] That is, they have attempted to transform their government culture from a social

welfare–oriented model of operation to a business-oriented one, with an eye toward enhancing the community's stock of financial, physical, human, cultural, and social capital. In turn, these assets are deployed in innovative ventures designed to alleviate poverty, create jobs, and foster community development.[22]

Financial Capital

How do highly competitive communities create the financial capital needed to promote their growth and development? Such communities have a strong entrepreneurial spirit and orientation, as well as a can-do attitude toward resolving their own problems.[23] Also, their economic development policies encourage innovation and adaptation, with an eye toward shaping the "evolution and ongoing change in a way that maintains [the] essential character and values [of the community]." "Unless a society and a community [are] open to the development of new ideas, they are unlikely to see much development."[24]

In a highly competitive community, the "government does not treat business with hostility or suspicion, but like a partner where both sides are expected to keep their part of the bargain." Further, highly competitive communities exemplify an "openness-to-new-ideas attitude, that is, a try-it-and-see if-it-works rather than a let's-go-check-with-the-authorities" attitude.[25]

These communities also have a healthy attitude toward failure. In Nashville, Tennessee,

> *[f]ailure . . . is an important part of the learning process; it sorts successful approaches from losing ones. Failure also makes change possible. Without failure, established companies are not forced to accept the painful processes of improvement.*
>
> . . . .
>
> *In an entrepreneurial culture, business failure is not a kiss of death, as it can be in more rigid economies. . . . [I]n a highly competitive community, investors, bankers, lawyers, and accountants expect some new ventures to fail, and also expect that failure to be followed by new efforts.*[26]

An aggressive business culture finds the necessary financial capital to generate growth and create jobs.

Silicon Valley's success relative to that of other high-tech nodes "stemmed from much more receptive attitudes about entrepreneurship and risk taking and a much greater tolerance and lower social stigma for business failure."[27] The key to the economic revival of Dallas, Texas, following the collapse of its energy and banking sectors in the 1980s was "a powerful, extremely aggressive business culture":

> *[A]t each stage of its development the primary impetus for growth . . . has come not from outsiders like New York bankers or Silicon Valley venture capitalists, but from local folks captivated by the restless, sometimes relentless entrepreneurial spirit that seems indigenous to the community.*
>
> . . . .
>
> *[T]he seemingly laid back demeanor and the slow, southern drawls of Dallasites are deceiving. . . . Dallas is a very sophisticated place. . . . [T]here's just this tremendous "can do" spirit here. You are judged on your character, and capable people can have a real effect.*[28]

For the foregoing reasons, a wealth of both traditional and nontraditional

sources of financial capital is available to foster business and community development in highly competitive communities. Typically, such communities "have strong traditional financial sectors that advise and nourish young companies, long before they have become profitable and can win a standard bank loan."[29]

Nashville, known for decades as the Wall Street of the South, epitomizes this spirit:

> *Ten venture capital firms with a combined investment portfolio worth hundreds of millions are based in Nashville. Since 1990, J. C. Bradford and Company, Nashville's most prominent investment banking firm, has helped entrepreneurs raise over $12 billion in initial public stock offerings, as well as more than $3 billion in private investments.*[30]

Reflective of the healthy attitude that investors have about risk in highly competitive communities, in Nashville,

> *[r]ich people . . . are willing to spin the big wheel a few more times, rather than clip coupons. . . . Investors here understand that most start-ups will go under. Perhaps six out of ten fail—and another three limp along. But the tenth one will blaze to the top, leaving fantastic earnings in its wake. Meanwhile, in some cities, investors are looking for guarantees, a sure thing.*[31]

In highly competitive communities, community development venture capital funds (CDVCFs) and other nontraditional sources of financial capital also are typically available. Traditional venture capital funds are professionally managed pools of equity capital typically sought for growth and expansion. CDVCFs are modeled after them but allow managers to seek a double bottom line—that is, both social and financial returns.[32]

Finally, in highly competitive communities, nonprofit organizations tend to be very enterprising. For example, some engage private-sector companies in mutually beneficial strategic partnerships that generate revenue:

- Cause-related marketing alliances—say, BMW donating money to the Susan G. Komen Breast Cancer Foundation each time a person test-drives one of its cars
- Affinity programs—alliances forged between major corporations and trade and professional associations
- Exclusive agreements—for instance, Huntington Beach, California, recently giving Coca-Cola exclusive "pouring rights" in all city-owned facilities, which will generate $6.7 million in new revenue for the city
- Selling of space—communities marketing a wide array of public spaces, including airports, transit systems, and sports venues, to private-sector companies to generate sorely needed revenue

Others operate for-profit arms, often referred to as "social-purpose ventures," that generate revenue. Still others pursue some combination of these strategies.[33]

The revenue accumulated via these efforts is called "community wealth," as opposed to personal or corporate wealth. This terminology is used because the revenue supports a wide range of activities designed to improve the overall health and well-being of communities and the people who live in them. The activities include improvements in infrastructure, within- and after-school programs for socially and economically disadvantaged youth, employment and training programs, and more.[34]

Physical Capital

To maintain and enhance their comparative advantage in the new-economy marketplace, highly competitive communities invest heavily in their physical capital—what is referred to as their "logistical infrastructure." This includes the network of highways, railways, airports, and telecommunications systems (telephone, Internet, etc.) connecting them to the regional, national, and global economy.[35] A community's physical capital also includes vacant and abandoned parcels of land that can be developed or redeveloped to make the community more attractive as a place to live and do business.

To attract entrepreneurs and new-economy businesses as well as to maintain connections to the regional, national, and global economy, a city's bridges, tunnels, rail lines, ports, and highways must be modern and in good repair. Nashville has consciously and purposefully invested in its transportation infrastructure so that it can benefit economically from its strategic location at the geographic crossroads of the country, a point where three interstate highway systems converge.[36]

> *Half the U.S. population lives within 600 miles of Nashville, and those people can be reached by a spider's web of rail lines, river routes, and highways that emanate out of Nashville. Small wonder that strategically located Nashville is a major shipping and distribution center for books, Bibles, and manufactured goods—it is the perfect home for a manufacturer's shipping center. That is one reason Ingram Inc., the world's largest distributor of books, has long been based in Nashville. Across town is Thomas Nelson, the world's largest publisher of Bibles. Nashville is also home to the world's largest sheet music publishers.*[37]

Dallas has pursued a similar strategy. After the collapse of its banking and energy sectors, it attempted to shed its detested "middle of nowhere" image by aggressively pursuing federal funding to develop I-35. This interstate highway now serves as the "main conduit between the American industrial heartland and Mexico's northern manufacturing centers." In part because of this investment in ground transportation, Dallas is known in some circles as the "capital of capitalism," a city where, in the 1990s, the growth of high-tech industry was greater than it was in Silicon Valley.[38]

However, strategic investments in airport facilities and broadband technology probably have been the most important factors in positioning new-economy cities to compete in the twenty-first century marketplace. For example, "'[l]ike the seaport, river and canal, train, and highway systems before them, air travel networks, particularly for air cargo, are now the leading logistical factor behind urban growth.'"[39] Nowhere has this been more apparent than in

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Transportation systems, such as railways, that link a community to the world around it constitute its physical capital.

Dallas, where leaders made a conscious decision to invest in three airports: Dallas–Fort Worth International, which ranks with Chicago's O'Hare as one of the nation's busiest air centers; Love Field, conveniently located near downtown; and Alliance Airport, developed and financed by Ross Perot as an industrial airport—the world's largest.[40]

To maintain and enhance their comparative advantage in the new-economy marketplace, highly competitive communities invest heavily in their physical capital.

Broadband technology is an equally important element of infrastructure:

> *[A]s cities of the past were built along railroads, waterways and interstate highways, cities of the future will be built along information highways—broadband communication links to homes, schools and offices, hospitals and cultural centers, and through the World Wide Web to millions of other locations all over the world.*[41]

However, when it comes to attracting new-economy businesses and jobs, the future is now for municipalities, since "access to broadband technology—T1, DSL, cable and the like—is key to competitiveness."[42] Today, in making decisions about location, businesses are asking three critical questions: How wired is your community? Can you get high-speed access to the Internet? What will it cost?[43]

The actions of Tacoma, Washington, illustrate the impact that wiring a community can have on a local economy:

> *In Tacoma, Washington, long a step-sister of glamorous Seattle, the municipally owned electric utility installed a fiber-optic network that covers 180 square miles and in the process brought new businesses and economic vitality to a place that was once bleakly described as "postapocalyptic."*[44]

Elaborating on the role of broadband technology in competitiveness, one business official noted, "We will soon be at a point where tenants expect bandwidth just as they do air conditioning."[45]

That municipalities cannot compete for new-economy business without the logistical infrastructure of highways, railways, airports, and telecommunication systems is best captured in the observation that "'the Web cannot move a box.'"[46] The problems that e-commerce businesses faced during the 1999 Christmas season illustrate the point.[47] Because of their failure to establish a network of distribution centers and a strategy for delivering products to customers in a cost-efficient and timely manner, many e-tailers had a disastrous 1999 holiday season. In the absence of such a logistical infrastructure, Toysrus.com and a host of other e-tailers accepted orders for products that already were out of stock. This meant that the purchased items could not arrive in time for Christmas. Angry parents filed lawsuits, and some of the e-tailers were eventually fined $1.5 million each by the U.S. Federal Trade Commission. An attorney who filed one of the lawsuits said,

> *There are lots of things in life that are excusable, but ruining Christmas for thousands of children isn't one of them. The thought that Toysrus.com had full knowledge they couldn't*

Customers may purchase items in cyberspace, but trucks and like vehicles are necessary to deliver the items.

keep the Christmas Eve date but continued to accept orders makes it even worse. To thousands of kids, Toysrus.com is the e-grinch that stole Christmas.[48]

In preparation for the 2000 holiday season, e-tailers invested large sums of money in logistical support and customer-service systems.[49] Municipalities with the necessary physical capital were the primary beneficiaries of these investments.

For communities that are striving to be more competitive in the emerging e-commerce economy, success will hinge on their ability to develop a bulletproof logistical infrastructure:

> *[T]he most important part of an online transaction occurs not in cyberspace, but rather at the customers' door. . . . [D]espite all the discussion about pure-play [cyberspace shopping "malls"] versus brick-and-mortar [traditional shopping malls], it is steel and rubber—in the form of vans, trucks and the occasional bicycle—that ultimately rules.*[50]

In addition to ensuring that new-economy businesses have the logistical infrastructure that they will need to compete, highly competitive communities employ the new technologies to enhance their own *polity capital*.[51] That is, they strive to make government more cost-efficient and -effective by bringing a wide array of services online. As the director of IBM's Institute for Electronic Government points out, in the fierce competition for new-economy employers,

> *[g]overnment has to move at the speed of business. . . . If it takes 12 weeks to get a permit to renovate office space, and a venture capitalist says the business needs to be up and running in 90 days, you lose out. That business is going to go where the process is timely.*[52]

By proactively and aggressively making the transition to e-government, or "smart government" as it is called, highly competitive communities send a signal to both start-up companies and established ones looking for a place to locate or relocate that their local business climate is highly supportive. Making this transition also substantially reduces the cost of doing the business of government. In highly competitive communities, the resulting cost savings are being channeled into efforts that address pressing social and economic needs that otherwise would go unmet.

Human Capital

Although a state-of-the-art logistical infrastructure is necessary, it is not sufficient to enhance community competitiveness in the new economy. "[W]hat brings about transformation is the people who can create in innovative and creative ways."[53]

Thus, in terms of a community's human capital, there are two keys to success in the new economy. The first is cutting-edge research facilities and top-notch education institutions.[54] However, their mere existence is not enough. Within these institutions the climate must allow scientists to translate research into viable commercial uses that will enable high-tech businesses, their supplier networks, and the local economy to grow and thrive. To facilitate this type of economic activity, Indiana has established a 21st Century Research and Technology Fund, which provides $50 million for research for the state's universities and private companies. Ohio State University reportedly

In a West Virginia community, providing laptop computers to students—an investment in human capital—dramatically improved the state's performance on national achievement tests.

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is considering using a small percentage of its $1.3 billion endowment as seed money to help small companies in Ohio grow.[55]

The second key is large-scale investments in the local education system (K–12, community college, and four-year institutions) to ensure the availability of education and training programs that will enable citizens to compete for new-economy jobs. For example, in Hundred, West Virginia, to strengthen the technological skills of the student population, business and government jointly developed a program that provided laptops to students. "[A]fter distributing 144 laptops to students for both home and school use, West Virginia has jumped from 33rd to 11th place on national achievement tests."[56] Such investments enhance a community's attractiveness to businesses.[57]

Discrimination often results in bias suits, and these create the impression that the environment does not tolerate diversity. Creating such an impression is unwise and counterproductive.

Cultural Capital

To ensure that the full benefits of a strong education and training system materialize, a highly competitive community invests heavily in its cultural capital—that is, in policies and procedures that undergird its citizens' values, attitudes, and beliefs about their current life chances and their future opportunities in the local community.[58] More specifically, a highly competitive community strives to manage its population diversity effectively, not solely for social or moral reasons (that is, because it is the right thing to do), but also as a form of enlightened self-interest (that is, because it is good for business). Communities that value rather than tolerate their cultural capital create a climate in which all citizens, regardless of race, ethnicity, gender, and so on, are fully able to maximize their potential to participate in the new economy and benefit from the fruits of their labor.

Dallas has long recognized the strategic importance of managing its cultural capital. Although its minorities have not benefited fully from the city's pro-business climate, Dallas has viewed racial strife as bad for business. In the 1920s, the city "waged a war against the Ku Klux Klan, noting that the Klan's presence deterred growth." "The kind of racial strife that decimated other cities, north and south, for the most part skirted Dallas. Largely, because it was bad for business."[59]

In a March 2000 speech, Federal Reserve Chairman Alan Greenspan put forth the same argument: "'Discrimination is against the interests of business. . . . Yet business people often practice it. In the end, the costs are higher, less real output is produced, and the nation's wealth accumulation is slowed.'" Also, as Massachusetts economist Cynthia Latta notes, "'Bias toward women, minorities, and the disabled is counterproductive[,] . . . a bit like shooting yourself in the foot.'"[60]

Discrimination often results in bias suits, and these create the impression that the environment does not tolerate diversity. Creating such an impression is unwise and counterproductive in the contemporary period, when international migration and interregional population shifts within the United States are dramatically changing the racial and

ethnic composition and complexion of communities.[61] Moreover, new-economy entrepreneurs and workers are themselves a diverse group in terms of race and ethnicity, immigration status, and lifestyle.[62]

Examples of cities that have not effectively managed their cultural capital abound. Because of their inability to manage their growing population diversity and its accompanying challenges, several cities, Los Angeles, Miami, and New York among them, have been sites of major civil disturbances, which have destroyed existing jobs and deterred new business development (including tourism).[63] For instance, nearly 100,000 jobs were lost in Los Angeles as a consequence of the 1992 civil unrest, and two years later, only 26,000 jobs had been created in the rebuilding process, resulting in a net loss of ~4,000 jobs. The job loss was concentrated among people of color, and the newly created jobs mainly benefited non-Hispanic whites, so the rebuilding effort served to exacerbate racial and ethnic divisions in the city. This, in turn, further tarnished Los Angeles's image.[64]

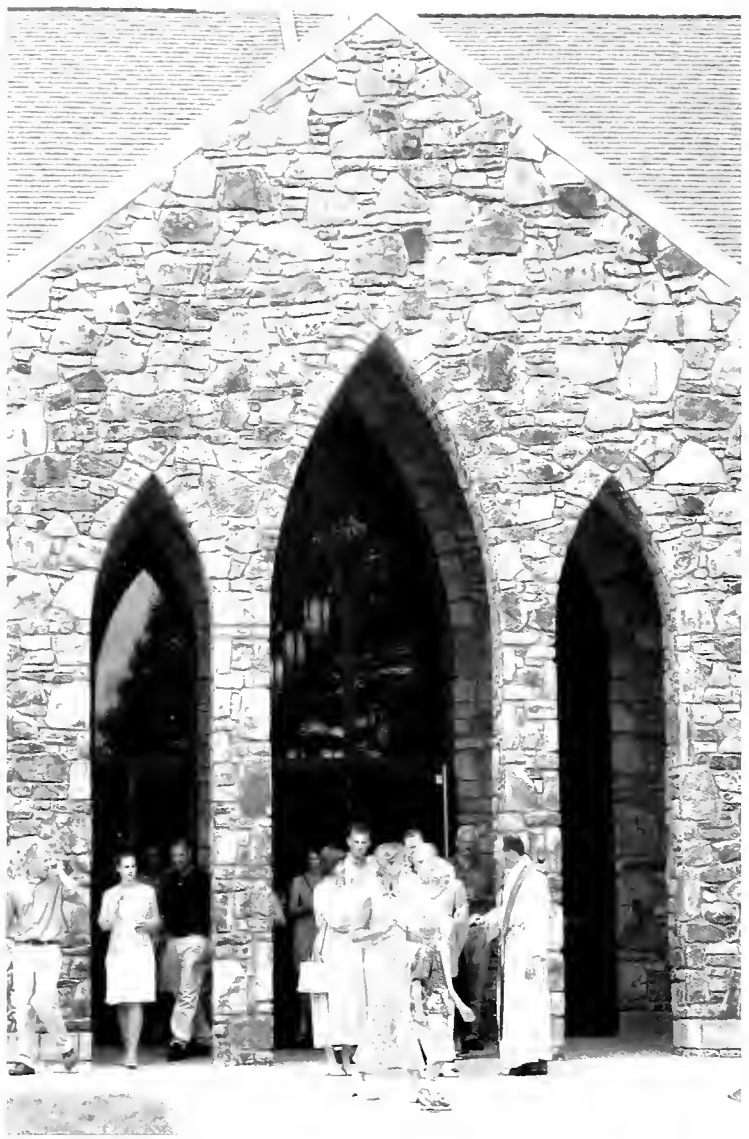
In other instances, local officials' cultural or racial insensitivity has triggered the exodus of businesses. For example, on March 31, 2001, Delta Airlines discontinued its Asia Pacific Gateway services at the Portland (Oregon) International Airport after repeated instances of foreign visitors on its flights from Japan being mistreated by Immigration and Naturalization Service officials (for example, being subjected to strip searches without just cause). In terms of economic impact, local officials estimate that this insensitive and inappropriate behavior, which strongly influenced Delta's decision to discontinue the services, could cost the state $900 million a year in lost revenue. It also has tarnished the city's image, especially among foreign travelers from Asia, and earned it a new name, DePortland (a play on the word "deportation").[65]

Social Capital

Highly competitive communities also invest in their stock of social capital. For present purposes, "social capital" is the contacts through which people maintain their social identity and receive emotional support, material aid and services, information, and new social contacts.[66] Such support can be obtained from individuals (for example, immediate and extended family members, friends, and fellow members of one's ethnic group) and institutions (for example, churches and community-based organizations). Highly competitive communities make substantial investments in an array of "bridging" institutions, such as the YMCA, the YWCA, and the Boys and Girls Club, which seek to knit a community together and provide links to social capital for residents, especially those who are socially and economically disadvantaged.

Highly competitive communities seek to build or rebuild social capital in an effort to reverse the growing inequality in U.S. society.[67] Most of their efforts are designed to overcome the social and personal isolation that undergirds this inequality.[68]

How do they do this? The government funds local institutions whose responsibility is to boost community involvement. Also, along with private-sector employers, it advocates policies that promote civic engagement and



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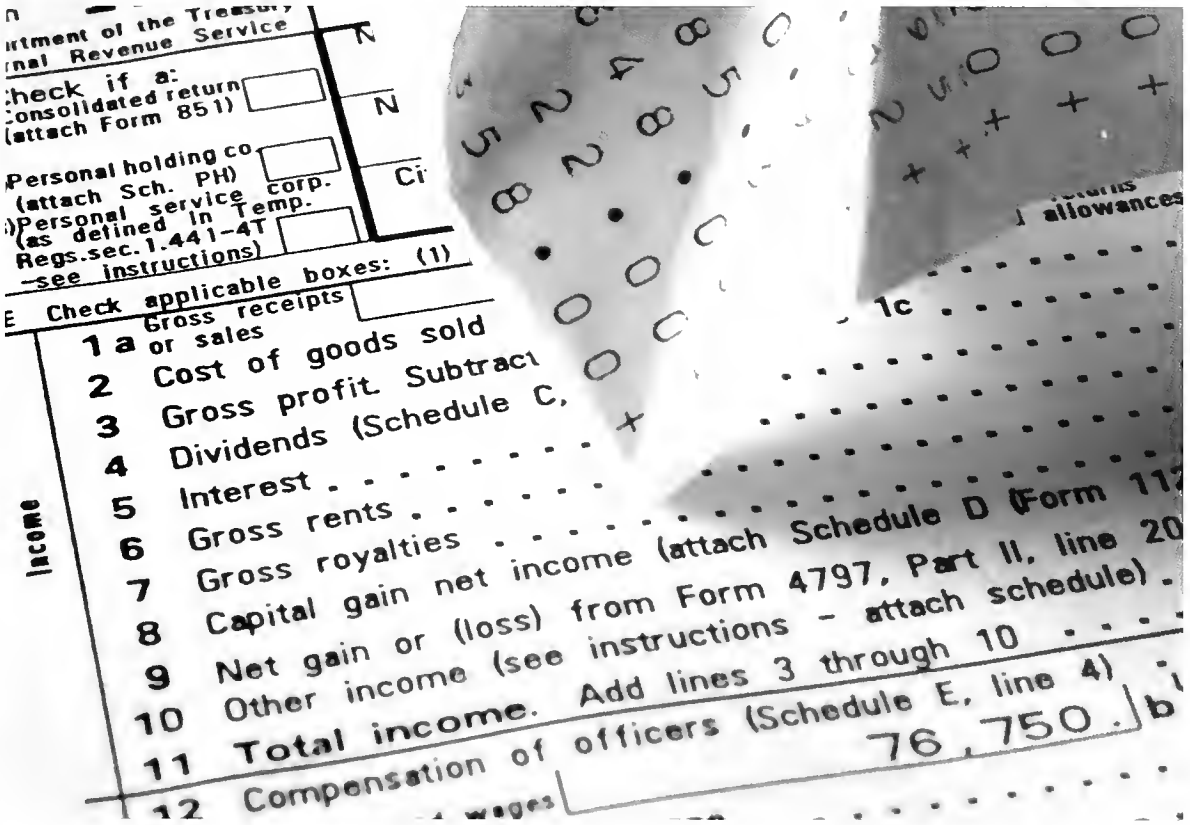
Churches and other places of worship are part of a community's social capital, offering social identity, emotional support, and human contact.



A community's tax structure significantly affects its attractiveness to entrepreneurs.

enable citizens to balance work, family, and community life better.[69]

In addition, highly competitive communities that use their *polity capital* to promote and facilitate strategic alliances among government, industry, and universities create a special kind of *social capital*. Such alliances facilitate the sharing of knowledge across organizational boundaries and promote the formation of trusting relationships, which, in turn, lead to transorganizational "communities of innovation."[70]

To ensure that the full complement of capital is present, a municipality's polity capital has to be dynamic and flexible, not static or bureaucratic.

Discussion and Proposed Action Plan

The absence of any one of the six types of community capital discussed earlier can seriously encumber the ability of a municipality to compete in the new economy. Philadelphia has many of the necessary ingredients. On the positive side,

> *[t]here are thousands of highly skilled workers, many first-class universities and secondary schools, and large reservoirs of wealth to finance a growing class of entrepreneurs. The region is, moreover, thick with small and medium-sized businesses, enterprises of practically every classification, with untold opportunities for additional growth. And there is capital—billions of dollars held by banks, venture firms, pension funds and others, available to finance good ideas."*[71]

However, most of the Internet business "winds up in Philadelphia's suburbs." Why? Because, as noted earlier, "Philadelphia's taxes and business climate send most entrepreneurs across the city line."[72] Even where there are empowerment or opportunity zones, in which tax breaks are offered to lure new firms, those tax breaks are offset by high rents for space.

Thus, to ensure that the full complement of capital is present, a municipality's polity capital has to be dynamic and flexible, not static or bureaucratic. To foster and enhance community competitiveness, the local government must assume the role of managing partner. It must be prepared —almost on an ad hoc basis—to foster networks among key community stakeholders to address both long-term and emerging issues that affect the health and the competitiveness of the community in the economic marketplace.

Depending on the nature of the problem, these networks may be industry- or sector-specific, ethnic based, or regional in composition.[73] In some instances they may involve business leaders who are staunch competitors in the local marketplace. In highly competitive communities, leaders of competing businesses often work together to solve local problems because they recognize that their "co-opetition" or "competitive collaboration" will ultimately redound to the benefit of their respective companies.[74] In other words, it is a form of enlightened self-interest.

This type of collaboration has been most clearly manifested in Charlotte, North Carolina. The former chief executive officers of Bank of America (Hugh McColl) and First Union National Bank (Ed Crutchfield), who were otherwise fierce competitors in the

financial services industry, over the years worked together to improve the health of the city and the quality of life of its people. In large part because of their collaborative efforts, Charlotte has been a magnet for people and jobs. Of course, both banks have benefited enormously from this growth.[5]

For North Carolina municipalities, developing their full complement of community capital is no longer an option; it is a strategic imperative. On the basis of the successful application of the model presented in this article in two locations (Gary, Indiana, and Grand Forks, North Dakota), I believe that North Carolina municipalities can profitably pursue the following three-pronged action plan.[6]

First, they must critically assess the strengths, the weaknesses, the opportunities, and the threats (SWOT) inherent in their existing stocks of polity, financial, physical, human, cultural, and social capital. On the basis of the results of these community-level SWOT analyses, they can develop coherent strategies to enhance the attractiveness of their communities as places to live and do business.

Second, since inadequate financial assets will be major obstacles to implementing the recommendations likely to have the greatest impact on their future competitiveness, local government and community leaders will have to acquire training and skills in civic entrepreneurship. Such training will equip them with the tools to pursue a wide range of entrepreneurial approaches (cause-related marketing alliances, affinity programs, and so on) that might generate new streams of revenue. They then can use this revenue to implement the recommendations that emanate from the community-level SWOT analyses.[7]

Third, to level the playing field for community and economic development, North Carolina municipalities must develop and implement strategic plans that will allow them to take better advantage of the emergence of information technology. Specifically, they must strive to develop a state-of-the-art technology infrastructure and viable plans and processes for creating knowledge workers, for making the transition to smart government, and for forging strategic electronic partnerships that link them to the regional, national, and global economy.

To launch this threefold action plan successfully, North Carolina municipalities, particularly the most economically distressed communities, will need financial support from both state and national foundations. They also will need managerial and technical assistance. The Institute of Government and the Kenan-Flagler Business School at The University of North Carolina at Chapel Hill, and the North Carolina Rural Internet Access Authority, can help provide the necessary technical support. If the necessary resources are strategically mobilized, this three-pronged action plan might serve as a national prototype for assessing and enhancing community competitiveness in the twenty-first century's knowledge-based economy.

Model for Rural Communities

With support from the Golden Leaf Foundation, the Institute of Government and UNC–Chapel Hill's Kenan-Flagler Business School are creating a model of economic development that rural communities can use to enhance their competitiveness. The model follows the steps outlined in the accompanying article. For more information, contact Anita Brown-Graham at (919) 962-0595 or brgraham@iogmail.iog.unc.edu.

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16. A Wharton Business School finance professor estimated that the city's wage tax was responsible for "the loss of more than 10,000 jobs between 1966 and 1986." Warner, *Taxes Are Not the Only Reason.*

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30. *Id.* at 42.

31. *Id.* at 44.

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37. *Id.* at 42.

38. Kotkin, *Capital of Capitalism*, at 4. In contrast to Dallas and Nashville, Boston, New York, Philadelphia, and Washington, D.C., have uneven highways, aging and crime-ridden ports, and railroad tracks in such poor repair that freight trains must travel at half speed. Minter, *Why Do Boom Towns Boom?*

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53. Appleton, *E-Town, USA*, at 61.

54. *Building Regional High-Tech Industry Clusters Requires Top Research Facilities Nearby, Milliken Institute Study Finds*, Business Wire, Aug. 10, 2000, available at www.businesswire.com.

55. Mike Pramik, *Tech Sweepstakes: Midwestern Cities Compete to Be the Next Silicon Valley*, Columbus Dispatch, Apr. 30, 2000, available through LEXIS-NEXIS. How do communities that do not have cutting-edge research facilities and top-notch education institutions enhance their competitiveness? The National Commission on Entrepreneurship advocates "enterprise facilitation," a people-based approach that seeks to build on the passion that exists in these communities for building new businesses (*see Enterprise Facilitation: Bringing Entrepreneurship to the Heartland?* NCOE Update, No. 36, Aug. 6, 2001, available at www.ncoe@sso.org). I advocate a parallel approach for North Carolina municipal leaders, especially those in communities that lack research facilities and higher education institutions: that they be trained in civic entrepreneurship, which is designed to enhance their entrepreneurial acumen and business skills.

56. James M. Morrow, *Study: "Net Illiteracy" to Plague U.S.*, E-Commerce Times, Oct. 2, 2000, available at www.e-commercetimes.com.

57. Michael Elliot, *The Big Test*, Newsweek, Sept. 6, 1999, p. 54.

58. William J. Bennett et al., Body Count: Moral Poverty . . . and How to Win America's War against Crime and Drugs (New York: Simon & Schuster, 1996); Lawrence E. Harrison, Who Prospers? How Cultural Values Shape Economic and Political Success (New York: Basic Books, 1992); Thomas Sowell, Race and Culture: A World View (New York: Basic Books, 1994).

59. Kotkin, *Capital of Capitalism*, at 3.

60. Greenspan and Latta as quoted in Diane E. Lewis, *Stop Bias*, Boston Globe, Mar. 23, 2000, pp. D2, D2.

61. Johnson et al., *Newly Emerging Hispanic Communities*; Frey, *The New Geography of Population Shifts*.

62. Kotkin, The New Geography.

63. Johnson et al., *Immigration Reform*.

64. James H. Johnson, Jr., et al., *Assessing the Employment Impacts of the Los Angeles Civil Unrest of 1992: Further Racial Division*, 11 Economic Development Quarterly 225 (1997). Another Los Angeles incident illustrates the impact of a community's failure to manage its cultural capital effectively: Following the brutal murder of two Japanese students in a grocery store parking lot, shopkeepers on Rodeo Drive in Beverly Hills—twenty-odd miles away from the scene of the crime—were affected financially as Japanese tourists literally stopped visiting Los Angeles.

65. Chris Barnett, *Portland Forwarders Upset by Delta Termination of Japan Service*, Journal of Commerce Online, Mar. 30, 2001, available through LEXIS-NEXIS; Florangela Davila, *Hard-Line INS under Fire in "Deportland,"* Seattle Times, Sept. 11, 2000, p. B5; Delta Air Lines Inc/DE/ (DAL), Quarterly Report (SEC Form 10-Q), Nov. 14, 2000, available at http://sg.us.biz.yahoo.com/; Nancy Fonti, *Delta Disbanding Gateway to Asia from Portland, Ore.; Japan Flights to End: West Coast City Will Become a Destination Served from U.S. Hubs*, Atlanta Journal and Constitution, Sept. 7, 2000, p. 3G; Sam Howe Verhovek, *Portland Immigration Official Resigns amid Furor*, The New York Times on the Web, Sept. 20, 2000, available at www.nytimes.com.

66. Walter Kiechel, *The New New Capital Thing*, Harvard Business Review, July–Aug., 2000, p. 149; David Moberg, *Not Quite Bowled Over*, In These Times, Jan. 22, 2001, p. 27; Robert Putnam, The Collapse and Revival of American Community (New York: Simon & Schuster, 2000).

67. James H. Johnson, Jr., & Walter C. Farrell, Jr., *Growing Income Inequality in American Society: A Political Economy Perspective*, in The Inequality Paradox: Growth of Income Disparity (J. A. Auerbach & R. S. Belous eds., Washington, D.C.: Nat'l Policy Ass'n, 1998); Bobo et al., Prismatic Metropolis.

68. Sue Pleming, *Isolated Society Called a Blow to Community*, Houston Chronicle, Dec. 24, 2000, p. A1.

69. *Id.*

70. Elias G. Caragyannis et al., *Leveraging Knowledge, Learning, and Innovation in Forming Strategic Government-University-Industry R&D Partnerships in the U.S., Germany, and France*, 20 Technovation, No. 9 (2000), available through LEXIS-NEXIS. David Leonhardt states that, owing to Minneapolis's development of such alliances, if any American city can reverse the growing wage inequality of the past two decades, Minneapolis can. He goes on to describe training programs that the city has developed via university/private-sector partnerships, that are designed to enable people to get better jobs that pay higher wages—to reduce the gap between the haves and the have-nots. *Minneapolis Shows the Way*, Business Week, Sept. 1, 1997, available at www.businessweek.com.

71. Andrew Cassel, *The* Philadelphia Inquirer *Andrew Cassell Column*, Philadelphia Inquirer, Mar. 6, 2000, available through LEXIS-NEXIS.

72. *Id.*

73. Kotkin, *Cities Need Leaders*.

74. John K. Conlon & Melissa Giovagnoli, The Power of Two: How Companies of All Sizes Can Build Alliance Networks That Generate Business Opportunities (San Francisco: Jossey-Bass, 1998).

75. In a recent Charlotte Observer article announcing the retirement of a senior vice-president who headed Bank of America's Community Development Corporation, another bank official reaffirmed the bank's commitment to the local community by making the following observation about the new chief executive officer, Ken Lewis: "Ken is dedicated to building our cities throughout our franchises. . . . He understands that Bank of America grows best when we grow along with the communities that we serve." David Perlmutt, *Bank of America Executive to Retire after 23 Years*, Charlotte Observer, Jan. 31, 2001, available at www.charlotte.com. The new chief executive officer of First Union has made similar statements about its commitment to the local communities in which it does business. Both banks, for example, are major investors in a new CDVCF, the Economic Opportunities Fund, which has been established to foster rural economic development in North Carolina.

76. James H. Johnson, Jr., Assessing Community Competitiveness in Grand Forks, North Dakota. Report prepared for the John S. and James L. Knight Foundation (Chapel Hill: Urban Inv. Strategies Ctr., Frank Hawkins Kenan Inst. of Private Enter., The Univ. of N.C. at Chapel Hill, June 2001); James H. Johnson, Jr., & Walter C. Farrell, Jr., Assessing Community Competitiveness in Gary, Indiana. Final Draft Report Prepared for the John S. and James L. Knight Foundation (Chapel Hill: Urban Inv. Strategies Ctr., Frank Hawkins Kenan Inst. of Private Enter., The Univ. of N.C. at Chapel Hill, Feb. 2001).

77. The University of North Carolina at Chapel Hill currently offers such a training program, the Management Academy for Public Health. A joint venture of the School of Public Health and the Kenan-Flagler Business School, it trains hundreds of state and local public health managers in four states (Georgia, North Carolina, South Carolina, and Virginia) in the core functional areas of business (for more information, visit the program's Web site, www.maph.unc.edu). This program can easily be adapted to train local government and nonprofit officials throughout the state. For example, recognizing that there are state-imposed constraints on local governments' ability to be entrepreneurial, the program could be revised to address those constraints and identify the areas in which local governments have substantial leeway to be entrepreneurial.

Best Practices in Reducing Waste

Charles Coe and James Hickman

Keeping unnecessary waste out of landfills extends their life.

North Carolina Department of Environment and Natural Resources

Not in my backyard!" (NIMBY) is an oft-heard, shrill rallying call for citizens opposed to having public facilities such as roads, hazardous waste sites, and especially sanitary landfills located near them. Finding a site for waste disposal in North Carolina is increasingly difficult, especially in fast-urbanizing counties. In reviewing applications for landfill permits, the state must consider a local government's process for site approval, including the socioeconomic impact of a new or expanded landfill within one mile of an existing landfill, as well as environmental justice policies of the U.S. Environmental Protection Agency (EPA).[1]

Along with state approval, local governments must seek acceptance from their citizens. Such acceptance is becoming increasingly problematic. For instance, between January and July 2000, citizens rejected the landfill proposals of Chatham, Duplin, and Halifax counties. Moreover, during the same period, permit decisions in Albemarle and in Anson, Greene, Mecklenburg, and Wake counties encountered legal challenges.

Reducing waste extends an existing landfill's life. Some local governments in North Carolina are national leaders in "diverting" waste (that is, keeping it out of the waste stream, through recycling and other means); others, however, lag behind. This article discusses best practices for reducing the waste stream, highlighting the state's top performers. The objective of the article is to help local governments follow best practices.

North Carolina in a National Context

Since data were first collected in 1988, the amount of municipal solid waste has outpaced population growth nationally and in North Carolina. From 1998 to 2000, national amounts increased by 10 percent, and from fiscal year (FY) 1997 to FY 2000, the amount of municipal

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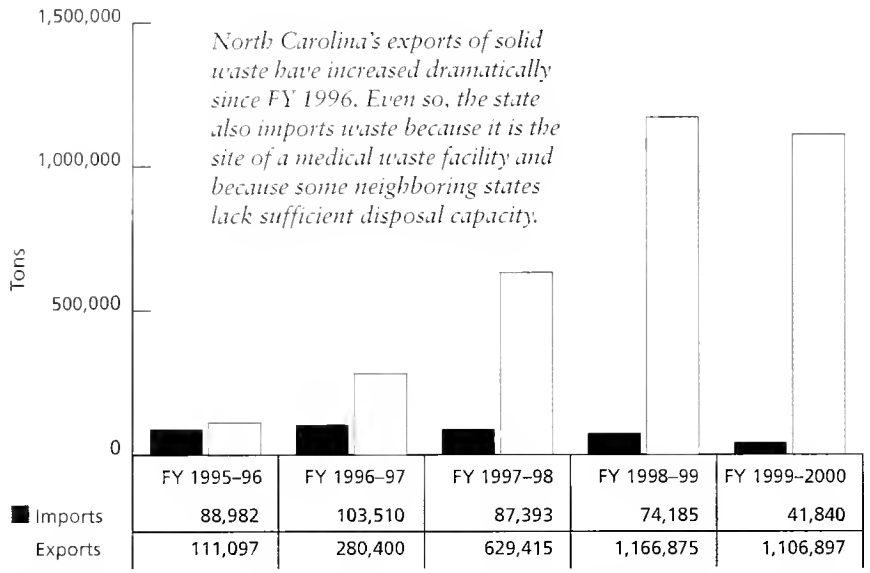
Figure 1. Imports and Exports of Solid Waste, North Carolina



	FY 1995–96	FY 1996–97	FY 1997–98	FY 1998–99	FY 1999–2000
Imports	88,982	103,510	87,393	74,185	41,840
Exports	111,097	280,400	629,415	1,166,875	1,106,897

Source: North Carolina Dep't of Env't and Natural Resources, Solid Waste Management Annual Report (Raleigh: NCDENR, 2000).

solid waste and construction and demolition (C&D) debris in North Carolina increased by 23 percent.[2] In 1989, hoping to minimize the growth of waste with effective waste reduction and recycling, the General Assembly passed the Solid Waste Management Act, which called for a voluntary reduction of 40 percent in waste per person by 2001. Instead, the state will likely experience a 40 percent *increase* by 2001 because of population growth and inconsistent practices of waste reduction among local governments.[3]

As municipal solid waste has increased, the number of landfill sites has dramatically decreased—in the nation, from about 7,900 in 1989 to 2,314 in 2000; in North Carolina, from 112 in 1991 to 41 in 2000. (In North Carolina, landfills have become larger and more regionalized as a result.) The decreases are principally attributable to the EPA mandate that landfills be lined, because unlined landfills release contaminating chemicals in the form of "leachate." In North Carolina all municipal solid waste had been placed in lined facilities by January 1998.

With the marked decline in landfills, transfer stations have become more prevalent. These are facilities that receive waste from homeowners, businesses, local governments, and private waste-hauling companies and consolidate it into larger truckloads (typically a tractor-trailer with a 20-ton cargo load), which then are taken to landfills. Currently there are 76 authorized transfer stations in North Carolina.

Considerable variation exists among states in amount of municipal solid waste generated and disposal capacity of existing landfills. Jurisdictions generating high amounts and constrained in disposal capacity are increasingly exporting their waste to other states. In 1999, 38.9 million tons were exported nationwide, with Illinois leading the pack (16 million tons). North Carolina ranked fifth in the total exported and had the largest increase (537,460 tons) from FY 1998 to FY 1999.[4] (For a depiction of the extent of importing and exporting in North Carolina from FY 1996 to FY 2000, see Figure 1.)[5]

There are three reasons for the dramatic increase in exports: decreasing landfill capacity, development of out-of-state landfills along North Carolina's borders, and competitive pricing among landfills.

Estimating the remaining landfill capacity in North Carolina is difficult because landfills are authorized for five years. In 1998, state officials estimated that the municipal landfills collectively had a remaining capacity of about five years; however, this figure may be as high as ten years. Nonetheless, North Carolina ranked among the lowest of the thirty-two states reporting landfill capacity in 1998.[6]

Waste Reduction: Best Practices

County waste reduction programs have greatly improved since the early 1990s. Most have been transformed from "green box" systems (unstaffed containers by the side of the road) to staffed convenience centers located in attractive, paved, fenced, and lighted areas. Likewise, many cities and towns have accepted the waste reduction challenge. Cities and counties use the following best practices:

- Education of citizens
- Reduction of waste at the source
- Adoption of a pay-as-you-throw system
- Enforcement of disposal diversion ordinances
- Effective recycling

Web Sites on Waste Reduction

Environmental Education
www.epa.gov?epaoswer/osw/kids.htm
Features a variety of activities and games for students in kindergarten through grade 6, including a poster and a storybook on fun ways to reuse old jelly jars.

Municipal Solid Waste
www.epa/gov/msw
Includes information on various methods of reducing and better managing municipal solid waste, such as source reduction and recycling.

North Carolina Recycle Guys Page
www.recycleguys.org
Provides facts on waste reduction and solid waste management in North Carolina, as well as resources for getting involved in reducing waste throughout the state.

Many cities and towns operate curbside recycling programs, picking up glass, aluminum cans, and other materials that residents place in special containers.

Education of Citizens

Of the 409 governments in North Carolina with recycling programs, 50 percent have one or more education programs to encourage waste reduction, as follows:

- Producing radio and television advertisements
- Writing newspaper articles and advertisements
- Doing mass mailings and informing citizens via their utility bills
- Making grants to innovative businesses
- Distributing promotional take-home items such as magnets and brochures
- Operating a telephone hotline to field questions
- Using a Web site to promote conservation
- Conducting informational workshops, forums, and conferences
- Making presentations at schools
- Promoting the Recycle Guys, cartoon characters who encourage waste reduction and recycling as part of an education campaign

Additionally, communities refer interested citizens and groups to helpful Web sites (see the sidebar, opposite).

Communities with education programs recover 22 percent more pounds per participating household and 47 percent more per household in the community, than communities that do not have such programs.[7]

Reduction of Waste at the Source

"Source reduction," also known as waste prevention, is reduction of waste before recycling. It results in significant environmental benefits and cost savings. Waste reduction should be a cooperative effort between government, business, and the citizenry. Businesses can design, manufacture, purchase, and use materials and products with reduction in mind. Through education and other incentives described in this article, local governments can encourage citizens to do the following:

- "*Grasscyle.*" Leave grass clippings on lawns. Usually containing about 4 percent nitrogen, 2 percent potassium, .5 percent phosphorus, and essential minor elements, clippings increase the amount of organic matter in the soil.[8]
- "*Xeriscape.*" Landscape with less water. Also, use native plants and grasses that tolerate the North Carolina climate, thereby reducing the need for watering and the generation of yard wastes.
- *Reduce junk mail.* Ask to have their names removed from many national mailing lists.[9]
- "*Enviroshop.*" Choose recyclable products and containers and recycle them. Also, purchase reusable products (for example, cloth napkins, rechargeable batteries, and refillable containers) and products with the least unnecessary packaging.
- *Reduce use of toxic substances.* For instance, select nontoxic inks; use less toxic cleaners, such as baking soda and vinegar; and purchase the least amount of chemicals to complete the job.
- *Compost yard and kitchen wastes in their backyards.* These wastes make up about 30 percent of the waste stream. "Composting" involves decomposing plant remains and once-living materials to make an earthy, dark, crumbly substance excellent

Table 1. **Programs in North Carolina Local Governments to Reduce or Reuse Solid Waste**

	FY 1994–95	FY 1995–96	FY 1996–97	FY 1997–98	FY 1998–99	FY 1999–2000
Source Reduction Programs						
Backyard composting	92	70	82	81	53	59
Grasscycling	49	40	41	43	41	36
Xeriscaping	12	12	11	13	12	11
Junk mail reduction	20	40	56	55	57	64
Enviroshopping	35	27	36	35	35	32
Promotion of nontoxics	38	34	39	35	30	31
Other	11	10	9	1	5	6
Reuse Programs						
Swap shops	NA	13	10	17	22	23
Paint exchange	17	22	28	25	27	23
Waste exchange	18	13	11	14	8	8
Pallet exchange	NA	NA	NA	NA	7	7
Other	NA	NA	4	6	15	10

NA = not available

Source: North Carolina Dep't of Env't and Natural Resources, Solid Waste Management Annual Report (Raleigh, N.C.. NCDENR, 2000).

County residents who live outside city and town limits often must take their recyclable waste to convenience centers, where they sort it by type.

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for adding to the soil of houseplants or for enriching garden soil. "Vermicomposting," an adapted type of composting, can be done cleanly and unobtrusively indoors in apartment buildings and condominiums. Local governments can create a demonstration site to explain composting visually and might offer plastic bins to residents for free or at reduced cost.

Further, local governments can offer waste exchange and reuse programs:

- *Swap shop:* a reuse program that allows residents to drop off items they do not want that may be useful to others. Most swap shops are small shed-type buildings located at drop-off recycling centers or convenience sites.
- *Waste exchange:* a program similar to swap shops, providing an opportunity for individuals and businesses to exchange materials they do not need with others that have a use for the materials.
- *Paint exchange:* a program that allows residents to drop off unwanted paint or pick up needed paint.
- *Pallet exchange:* the same as waste exchange but involving an exchange

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Waste haulers take recyclable products from communities to material recovery facilities, where they are sorted, baled or compressed, then transported to a manufacturing plant.

Table 2. **Waste Recycled by North Carolina Counties, FY 2000**

County	Lbs./ Person	County	Lbs./ Person	County	Lbs./ Person	County	Lbs./ Person
Montgomery	491.40	Brunswick	145.31	Cabarrus	75.79	Gaston	53.48
Pitt	442.29	New Hanover	138.48	Polk	74.93	Hyde	53.12
Catawba	336.25	Alleghany	124.26	Rowan	74.90	Greene	52.17
Mecklenburg	304.10	Graham	123.34	Edgecombe	72.11	Davidson	48.51
Pamlico	299.27	Currituck	116.44	Chowan	71.84	Anson	47.96
Tyrrell	295.53	Ashe	116.36	Hertford	71.72	Randolph	47.53
Dare	283.67	Lenoir	115.55	McDowell	69.80	Camden	47.25
Macon	256.30	Wake	110.16	Avery	68.75	Caswell	39.54
Davie	244.77	Forsyth	105.90	Washington	68.75	Vance	38.71
Orange	217.82	Wilkes	105.71	Cleveland	67.42	Stanly	38.71
Swain	211.18	Lee	101.02	Alamance	67.17	Richmond	36.34
Jackson	208.69	Caldwell	100.80	Nash	66.22	Warren	35.36
Watauga	205.46	Carteret	100.12	Martin	65.62	Johnston	33.99
Craven	202.37	Burke	99.41	Wilson	65.18	Yancey	32.79
Duplin	195.74	Rutherford	93.52	Rockingham	64.99	Northampton	32.52
Buncombe	184.49	Wayne	90.91	Gates	64.14	Onslow	32.24
Durham	174.07	Pender	90.06	Franklin	63.87	Stokes	31.81
Transylvania	172.20	Lincoln	89.85	Jones	61.92	Cherokee	28.58
Haywood	170.87	Yadkin	88.95	Beaufort	61.67	Harnett	26.25
Mitchell	162.33	Henderson	86.32	Alexander	61.52	Bladen	20.01
Pasquotank	155.48	Granville	81.91	Iredell	61.29	Halifax	19.54
Union	155.44	Scotland	81.76	Surry	61.04	Cumberland	19.12
Guilford	149.60	Perquimans	77.96	Person	56.81	Bertie	17.95
Chatham	148.22	Columbus	77.43	Hoke	56.38	Clay	12.36
Madison	146.26	Moore	76.24	Sampson	54.49	Robeson	4.17

Source: Adapted from North Carolina Dep't of Env't and Natural Resources, Solid Waste Management Annual Report (Raleigh: NCDENR, 2000).

Table 3. **Waste Recycled by North Carolina Municipalities of More than 10,000 People, FY 2000**

Municipality	Lbs./ Person	Municipality	Lbs./ Person	Municipality	Lbs./ Person
Greensboro	200.63	Concord	102.33	Lexington	53.87
Boone	187.49	Asheboro	95.91	Washington	53.42
High Point	184.89	Garner	92.74	Thomasville	53.40
Hickory	178.13	Morganton	91.94	Greenville	52.58
Durham	159.90	Kinston	91.61	Elizabeth City	51.31
Salisbury	155.79	Southern Pines	91.00	Rocky Mount	47.41
Cary	153.87	Eden	88.86	Goldsboro	44.05
Matthews	152.22	Lenoir	86.42	Smithfield	43.56
Clemmons	138.55	Indian Trail	82.31	Statesville	42.72
Asheville	128.06	Reidsville	80.36	Tarboro	39.46
Laurinburg	114.02	Kernersville	80.02	Albemarle	37.26
Winston-Salem	111.92	Wilmington	77.47	Gastonia	33.66
Huntersville	109.66	Lincolnton	66.49	Henderson	33.43
Raleigh	106.60	Wilson	64.60	Graham	31.77
Newton	103.99	Wake Forest	61.46	Burlington	27.99
Apex	103.77	Sanford	61.41	Jacksonville	19.33
Charlotte	103.28	Monroe	57.61	Roanoke Rapids	10.71
Cornelius	102.69	Mint Hill	56.65	Lumberton	4.65

Note: Some municipalities of more than 10,000 people are not included because they have no recycling program or because tonnages recovered could not be determined

Source: Adapted from North Carolina Dep't of Env't and Natural Resources, Solid Waste Management Annual Report (Raleigh: NCDENR, 2000).

of pallets among industries, construction companies, and commercial businesses.

Although the diversion programs discussed here cost little, relatively few governments in North Carolina offer them. The number of backyard composting, grasscycling, and enviro-shopping programs has declined since FY 1995 (see Table 1, page 22). Swap shop programs, on the other hand, have increased from 13 to 23, partially because the North Carolina Department of Environment and Natural Resources (DENR) funds them.

Adoption of Pay-as-You-Throw System

Governments can encourage citizens and businesses to reduce waste at the source by implementing a "pay-as-you-throw" (PAYT) system. Also known as variable-rate or unit-based pricing, such a system charges residents for collection on the basis of the amount of waste they discard. PAYT began in 1916 but did not become popular until the early 1990s. By 1998 more than 4,000 communities nationally had adopted a PAYT system. To date, 17 counties and 7 cities in North Carolina have adopted such a system.[10]

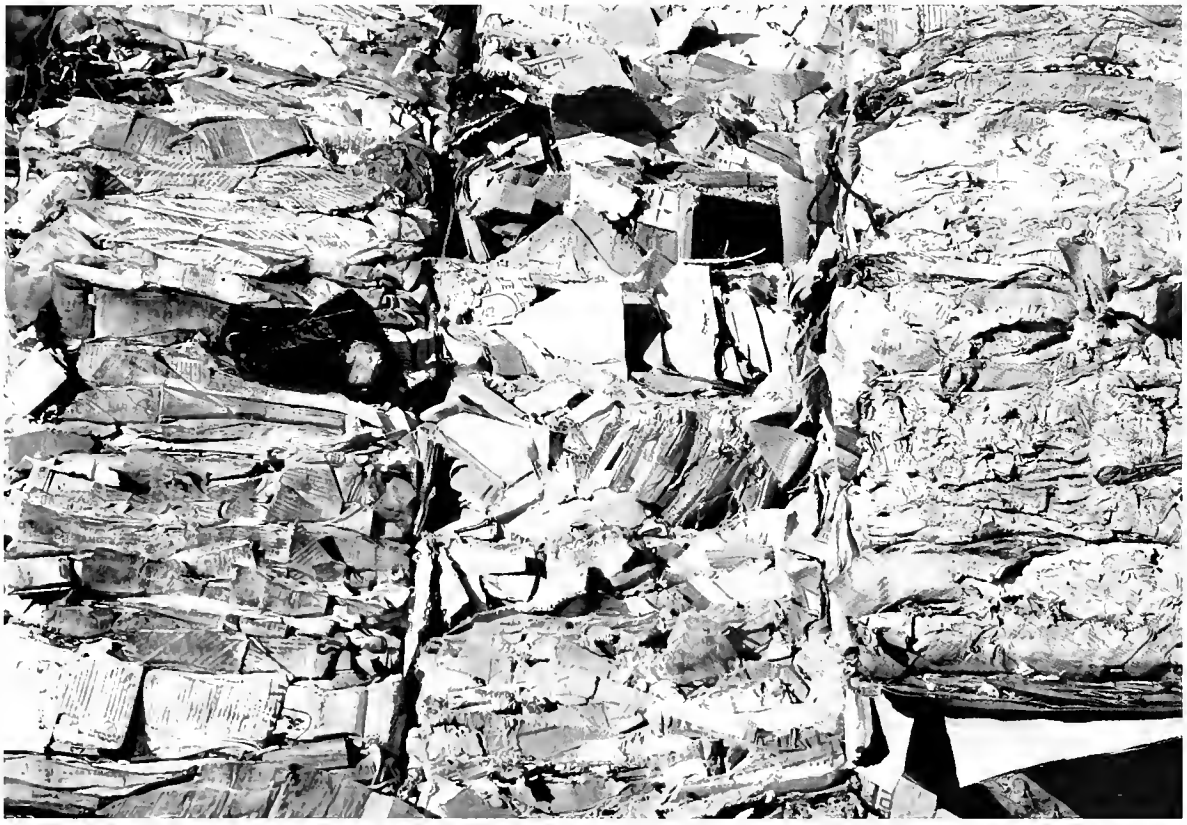
Not surprisingly, some citizens initially resist switching to a PAYT system, disliking paying for what they perceive to have been a free service. If people do not realize that they are paying for waste collection through general tax revenues, they may hesitate to start paying directly for it through a fee. Hence policy makers, fearing political repercussions, may shy away from variable rates. Yet the efficiencies are great. One study found that increased recycling, source reduction, and yard waste diversion in PAYT communities resulted in a 16–17 percent decrease in disposal.[11]

Perhaps partially offsetting the benefit of PAYT systems is that they may induce citizens to dispose of waste improperly. Ways to discourage undesirable diversion include locking commercial dumpsters, strictly enforcing littering and anti-burning ordinances, educating the public, and providing free drop-off days for bulky items or garbage in general. To date, there is no evidence of illegal disposal in the North Carolina communities that have implemented a PAYT program.

Enforcement of Disposal Diversion Ordinances

As of FY 2000, sixty-eight local governments had passed disposal diversion ordinances (DDOs) that impose stricter requirements and penalties than the state's laws banning aluminum cans, lead-acid batteries, old tires, "white goods" (appliances), used motor oil, antifreeze, and yard waste from disposal in municipal solid waste facilities. DDOs range from outright bans of selected products (for example, aluminum cans) to requirements that material be separated for recycling. The majority of DDOs divert corrugated cardboard, but some also divert clean wood, pallets, and traditional household recyclables. Durham has an extensive ordinance banning five materials: glass bottles and jars, aluminum cans, steel cans, newspapers, and corrugated boxes. Residential violators receive three warnings on brightly colored stickers. The fourth violation results in a warning letter. Thereafter, the city charges individual residents $15 per violation and businesses $50 per violation. Waste haulers caught with banned materials at a transfer station must pay double the "tipping fee" (the cost per ton disposed of) for the whole load. After just six months of having the ordinance in force, participation in the residential recycling program in Durham increased from 60 to 80 percent.[12] Columbus and Iredell counties passed DDOs banning corrugated cardboard, and both experienced significant increases in the recovery of this item. Whiteville, in Columbus County, increased cardboard recovery by 1,862 percent during FY 2000, although its ordinance was in place for only part of the year.

Before passing an ordinance, local governments should thoroughly understand their waste stream. Some materials are common to all waste streams, whereas others are specific to individual communities. For instance, Wake



Masses of corrugated cardboard await recycling.

County discovered that corrugated cardboard constituted 26 percent of its commercial waste stream, so it enacted a landfill disposal surcharge on that material. The next step is to determine whether recycling capabilities are adequate to handle targeted materials. For instance, to recycle cardboard, a community needs either private haulers or local governments to take the cardboard to paper stock dealers or material recovery facilities (see the later section entitled "Proximity of material recovery facilities"). Although local governments may collect and process materials, relying on the private sector is usually cheaper. If existing infrastructure is not available, local governments may be able to create it. For instance, Pasquotank County contracted with a major local hauler to build a processing facility for corrugated cardboard.

In designing a DDO, local officials must determine the community's tolerance level (a complete or a partial ban may be appropriate), means of enforcing and inspecting for compliance, the point of compliance, the material to be targeted, the grace period before enforcement, and the penalties.[13]

Effective Recycling

On balance, the recycling story in North Carolina has not been promising in recent years. The amounts of traditional materials recycled—such as glass, plastics, and aluminum and steel cans—continue to decline. The recovery of organic materials, which can fluctuate greatly from year to year, has increased because of material generated by Hurricane Floyd.

Metals have the highest recovery rate of traditional recyclables, about 25 percent. Glass, paper, and plastic recovery rates average 14, 10, and 4 percent, respectively.[14]

The state records how much waste local governments dispose of in landfills and how much they recycle in pounds per person and per household. In FY 2000 the countywide average per person was 108.50 pounds, ranging from 491.40 in Montgomery County to 4.17 in Robeson County (see Table 2, page 23).

Among the leaders in county waste reduction are Craven and Orange counties, which offer a wide range of programs—backyard composting, source reduction, reuse, recycling (of glass, cans, etc., plus oil, oil filters, antifreeze, and batteries), education, local bans on disposal, pay-as-you-throw, household hazardous waste collection, mulching/composting, and C&D reuse/recycling. However, a major recycler of construction debris in Craven County was closed in 1999 because of operational difficulties, resulting in a lower per person recovery than in prior years.

In fifty-four cities of more than 10,000 in population, the amount recycled in FY 2000 ranged from 200.63 pounds per person in Greensboro to 4.65 pounds per person in Lumberton, with an average recovery of 85.28 pounds per person (see Table 3).

Among the top ten municipal programs, some practices are prevalent:

- All use curbside collection.
- Nine provide collection once a week.
- Eight educate citizens about waste reduction.
- Seven augment curbside collection with drop-off recycling services.
- Six have access to a material recovery facility that accepts mixed waste.
- Four provide recycling services to commercial customers as well as residential ones.

- Four ban particular materials from disposal or require separation of materials.

In the following sections, we discuss five factors that influence productivity in recycling.

Method of collection. Jurisdictions provide three types of recycling services: at the curb, at a drop-off facility, or both. Because they are less dense than cities, counties usually offer drop-off facilities. Municipalities typically offer curbside service, which varies in frequency of pickup and type of collection —that is, materials separated by homeowners or commingled at the curb. Common in the early 1990s, programs calling for separation of materials by homeowners have sharply declined because the extra effort required of citizens discouraged them from recycling. Hence, almost all programs in North Carolina now involve commingling of materials. Collectors either sort materials at the curb or take them to a center for sorting.

County and municipal recycling operations also differ in who runs them. Most counties (57 percent) operate programs themselves. In contrast, most municipalities (78 percent) use private service providers because they cannot afford the capital investment needed to operate curbside recycling programs. Kannapolis and Fayetteville are the only cities of more than 30,000 in population that provide no recycling services of any kind. Robeson County is the only county with no program.

Although privatization of recycling is prevalent among municipalities, it is not necessarily effective. Publicly operated systems recover approximately 324 pounds per household served, compared with 241 pounds per household recovered in privately run programs. Further, cities that contract for recycling services still need to operate education programs about waste diversion.

Materials collected. Before the EPA required lined landfills, C&D waste was usually disposed of in the same landfill as municipal solid waste. Although C&D waste may still be disposed of in lined landfills, it goes mostly to separate C&D facilities, where tipping fees are lower because of lower landfill construction and operating costs. In FY 2000, C&D waste made up 29 percent of the waste stream. C&D facilities received 22 percent, lined facilities 7 percent. The volume of C&D waste is increasing, yet only 13 local governments recycle C&D waste, only 13 salvage C&D waste, and only 3 do both.

Considerable variation exists in the collection of special wastes, such as car products and household hazardous waste. The number of gallons of used oil collected increased by 18 percent from FY 1999 to FY 2000, but the increase was not uniform across the state. For instance, 12 rural counties have no public collection sites, and 26 others have just one. Only 38 of the state's 529 cities collect oil. Of all the county and municipal governments, only 14 collect oil filters, 49 antifreeze, and 24 hazardous waste.

Proximity of material recovery facilities (MRFs). Moving recycled material from a home or a business involves three steps: collection, processing (for example, baling or crushing) for transport, and delivery to a manufacturing plant. MRFs consolidate items for efficient transportation, linking collected materials to end-use markets. MRFs accept mixed materials, separate them by specific commodities, and often bale or compress them. Local governments either operate their own MRFs or contract with privately operated MRFs. Four MRFs are operated by vocational centers with minimal financial support from local governments. The MRFs provide jobs and skill training. Two counties (Davidson and Davie) keep operational costs low by using inmate labor.

Because markets for recycled waste are usually outside a community, processing and transportation are crucial to successful marketing. The presence of an MRF makes a difference in the kind and the amount of materials collected per person.

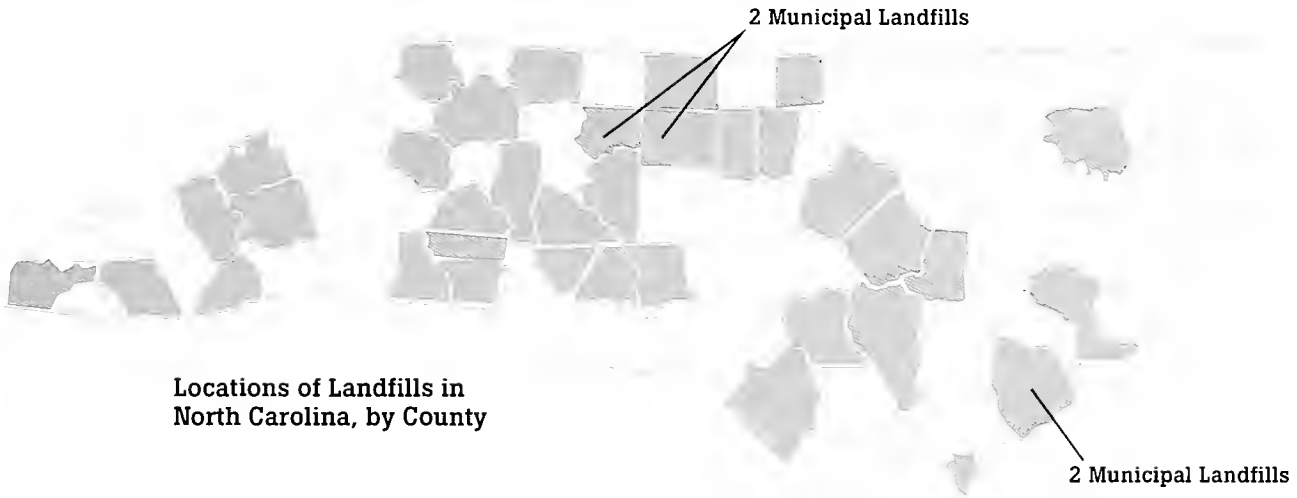
For their size, Greensboro and High Point, with programs supported by MRFs, have considerably higher per person rates of curbside recycling than Raleigh and Wilmington. The contrast between Greensboro and Raleigh also is notable regarding the kinds of materials collected. Although other factors contribute to the success of recycling programs, MRFs give a marketing stability that allows greater flexibility in the kinds of materials collected and the control of collection costs. MRFs enable numerous haulers individually marketing collected materials to sell them at a centralized location. MRFs thereby effect economies of scale and greater market demand.

MRFs also have proven their worth by offering much-needed market outlets for small municipalities and counties. The Eastern Carolina Vocational Center, an MRF in Greenville, receives materials from many small towns and counties surrounding Pitt County and serves as a critical regional outlet for collected glass. Private haulers who serve small municipalities with curbside services rely on the Eastern Carolina Vocational Center to take their materials, sometimes from communities more than 100 miles away. Similarly, Mecklenburg County's MRF offers a market for materials collected by local governments in Union County.

Availability of markets for recycled goods. Revenue from recycled materials depends on the prices of particular materials, and they vary widely. For example, in 2001 the market price for steel cans ranged from $17.25 per pound in eastern North Carolina to $26.25 in the western part of the state and $30.00 in the central region, and the market price for clear glass ranged from $25.00 per pound in the east to $38.50 in central and western North Carolina.

Governments can improve their markets by doing the following:

- *Regularly communicating with purchasers of materials.* There is no substitute for direct and frequent communication with markets.
- *Tracking market conditions.* Knowing current market conditions and market projections enables local units to get the most competitive prices.
- *Improving processing efficiency.* Reducing processing and transportation costs increases markets.
- *Partnering with markets on processing capacity.* Markets often are willing to supply processing equipment in return for materials.



Locations of Landfills in North Carolina, by County

- *Taking advantage of existing processing capacity.* In some areas, counties have developed processing capacity that other counties can use. Regional cooperation improves the ability to market materials.
- *Using contracts wisely to build long-term relationships.* Chasing "spot markets" for short-term windfall revenues in good times is risky over the long run. The better option is to enter into long-term contracts for materials that include a "floor," or minimum price. Prices are generally lower than current market prices but provide protection during market downturns.
- *Investing in processing capacity.* The best way to optimize relationships with recycling markets is to invest in processing capacity, such as an MRF or smaller facilities housing balers or storage trailers. Local governments also can encourage private processing through bans on disposal of materials and long-term collection contracts.
- *Buying products made from recycled materials.* Extensive research has shown that recycled products are competitive with virgin products in quality and cost.
- *Developing markets.* Local units should disseminate good data that show processors' market potential.

Existing and future landfill capacity. The extent of existing and projected landfill capacity may significantly affect a local unit's motivation to recycle. Policy makers whose landfills have relatively little capacity and who have limited options regarding the location of new landfills have the most incentive to follow best recycling practices. (For the locations of existing landfills, see the map on this page.)

Conclusion

Reducing waste makes both economic and environmental sense. Governments of all sizes can educate their citizens about reducing waste and can promote waste reduction at the source. Communities also might take a hard look at creating a PAYT system and adopting a DDO for troublesome materials such as aluminum cans and corrugated boxes.

Finally, and most important, jurisdictions can evaluate the effectiveness of their recycling programs by seeing where they stand relative to other jurisdictions in regard to amount of waste recycled (see Tables 2 and 3). Cities and counties now recycling relatively low amounts would do well to emulate the best practices of the high-performing localities. Policy makers might contact the high-performing localities to learn what practices can be emulated. Following up with a site visit might enable them to understand and apply best practices better.

Notes

1. N.C. GEN. STAT. § 160A-325, 153A136(c).
2. Nora Goldstein, *The State of Garbage*, BIOCYCLE, Apr. 2000, pp. 32, 33.
3. NORTH CAROLINA DEP'T OF ENV'T AND NATURAL RESOURCES, SOLID WASTE MANAGEMENT ANNUAL REPORT (Raleigh: NCDENR, 2000).
4. Goldstein, *The State of Garbage*, at 34.
5. As well as exporting waste, North Carolina imports it because the state has a medical waste facility that other states use and because some out-of-state local governments near North Carolina have limited disposal capacity.
6. *Id.* at 33.
7. NORTH CAROLINA DEP'T OF ENV'T AND NATURAL RESOURCES, SOLID WASTE MANAGEMENT ANNUAL REPORT (Raleigh: NCDENR, 1999).
8. UNITED STATES ENV'TAL PROTECTION AGENCY, ENVIRONMENTAL FACT SHEET: RECYCLING GRASS CLIPPINGS 1 (Washington, D.C.: EPA, July 1992).
9. To have their names removed, people can write to Mail Preference Service, Direct Marketing Association, 11 West 42nd Street, P.O. Box 3861, New York, NY 10163. This is a free service.
10. Further information on PAYT systems is available at www.p2pays.org/payt.
11. LISA SKUMATZ, MEASURING SOURCE REDUCTION: PAY AS YOU THROW/VARIABLE RATES AS AN EXAMPLE (Seattle, Wash.: Skumatz Economic Research Assoc., Mar. 2000).
12. James Hickman et al., *Recycling Rules in Durham*, RESOURCE RECYCLING, Sept. 2000, p. 17.
13. For more information, *see* NORTH CAROLINA DEP'T OF ENVIRONMENT AND NATURAL RESOURCES, DISPOSAL DIVERSION ORDINANCES, Aug. 1999 update, available at www.p2pays.org/search/pdfframe.asp?pdfurl=/ref/01/00782.pdf.
14. NORTH CAROLINA DEP'T OF ENV'T AND NATURAL RESOURCES, SOLID WASTE MANAGEMENT ANNUAL REPORT (Raleigh: NCDENR, 1999).

Ensuring the Integrity of Crucial Data

William C. Rivenbark and Carla M. Pizzarella

The manager of Carolina City scans the headlines of the daily morning newspaper while preparing for a senior staff meeting. An article about performance measures in Tarheel Town, a neighboring city, catches his attention. Tarheel Town adopted an internal performance measurement system eighteen months earlier to address a general public perception of poor service delivery. According to the article, in a city council workshop the night before, the relatively new manager of Tarheel Town presented and discussed numerous performance statistics generated by the system, among them, 3.0 minutes average response time for high-priority police calls, 142 dispatched calls per police patrol officer, and 55 percent clearance rate for UCR (uniform crime reporting) Part I crimes assigned to investigators.[1]

The manager of Carolina City opens his city's annual operating budget and turns to the section on police services. He finds the following corresponding statistics: 2.8 minutes average response time for high-priority police calls, 155 dispatched calls per police patrol officer, and 29 percent clearance rate for UCR Part I crimes assigned to investigators. He highlights the statistics in his city's budget and clips the article in the newspaper, deciding to discuss the information with senior staff. Why, he wonders, does Tarheel Town's performance in these three areas differ from the performance of Carolina City, especially in the clearance rate for UCR crimes?

PERFORMANCE MEASUREMENT WORKSHEET

Agency Name: _____

Agency Code: _____

Contact Person: _____ Phone: _____

Agency Goals:					
Service Area:					
Service Area Objectives:					
	Input Indicators	Output Indicators	Efficiency Indicators	Service Quality Indicators	Outcome Indicators
Indicator					
Indicator Calculation					
Data Source(s)					

REMINDER: Accuracy of the information provided above determines the data's usefulness for budgetary planning, managerial decision-making, and operational improvement.

Performance measurement is now a common management tool in local government, especially in larger jurisdictions.[2] It provides a systematic approach to assessing, monitoring, and improving service delivery by creating and tracking measures of workload, efficiency, and effectiveness.[3]

In recent years, to enhance their performance measurement systems, localities also have embraced benchmarking. "Benchmarking" involves tracking performance measures over time (trend analysis), comparing performance measures with established objectives or targets, or comparing performance measures with the results of other jurisdictions.[4]

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Both Carolina City and Tarheel Town use performance measurement, and informally at least, the concerned manager of Carolina City is using Tarheel Town as a benchmark. But suppose the two jurisdictions are not basing their performance statistics on comparable data. That might account for the apparent difference in performance.

Auditing or verifying the accuracy of data used to create measures of performance is an area of performance measurement and benchmarking that has received minimal attention.[5] Localities are accustomed to having their financial data audited. They are not accustomed to having their performance data audited. A critical step in performance measurement and benchmarking is the establishment of an internal or external review process to ensure that performance measures are materially accurate, reliable, and comparable.[6]

This article presents the results of a performance measurement audit conducted by staff of the North Carolina Local Government Performance Measurement Project (the North Carolina Project) for the three functional areas of police services: patrol, investigations, and emergency communications. It begins by providing a brief overview of the North Carolina Project and the purpose of the audit. It then reports the audit results, discussing five general areas that affect the accuracy and the comparability of performance data.

Background

The North Carolina Project is a benchmarking consortium of fourteen municipalities, four professional organizations, and numerous local government officials. It was established to promote performance measurement in local government, to produce comparable performance and cost data for participating units, and to encourage use of the data to improve services or processes. Institute of Government faculty and staff manage it under the guidance of a steering committee made up of representatives from each participating jurisdiction. The project annually publishes a performance and cost data report on the service areas under study and the performance measures

Abbreviated Audit Report on Emergency Communications

The scope of the performance measurement audit for emergency communications included the service profile form for that function, related performance and cost data in the Final Report on City Services for FY 1999–2000, and on-site interviews with emergency communications personnel for each participating unit. The audit was conducted during March and April 2001, concluding with an exit conference in May 2001.

Methodology

In February 2001, project staff developed a questionnaire and distributed it to each participating municipality. They used it to obtain initial information on how the municipality was collecting and reporting performance data. They then conducted on-site visits to detail how the participating municipalities were collecting and reporting data and to determine what their capabilities were for collecting and reporting other data. Project staff used the information from the on-site visits to generate the findings and the recommendations that follow.

Findings

1. A series of events occurs between the time a call requiring dispatch is placed and the time the call is dispatched. (For the steps in handling an emergency call, see Figure 1.) Variations such as routing patterns may exist across jurisdictions.

Figure 1. **Steps in Responding to Emergency Calls**

- Caller dials E-911 (or other number).
- Call is received by telephone company switching center and routed to Emergency Communications Center.
- Call rings in Emergency Communication Center.
- Call is answered by telecommunicator (beginning of talk time).
- Call is entered into CAD (computer-aided dispatch) system and routed, if necessary, to appropriate dispatcher.
- Call is ready for dispatch (and unit begins to respond if available).
- Call is held until unit is available to respond (if response is not immediate).
- Unit is assigned and responds to call.

2. Interpretation of the measure "Average time from receipt of call to dispatch, for calls resulting in a dispatch" has varied in the determination of when "receipt of call" begins:
   - For one jurisdiction, "receipt of call" begins when the call is registered by the telephone company.
   - In another case, "receipt of call" has been interpreted as being the moment when the telephone call is answered by the telecommunicator.
   - In most cases, "receipt of call" has been interpreted as being the moment when the call is first keyed into the CAD system.

Continued on page 30

Continued from page 29

3. Interpretation of the measure "Average time from receipt of call to dispatch, for calls resulting in a dispatch" has varied in the determination of when "dispatch" begins. The definition of "dispatch" and the reporting structures of CAD systems appear to differ from jurisdiction to jurisdiction:
   - For at least one jurisdiction, "dispatch" represents the time when the telecommunicator makes the call available for dispatch. In this instance, "Average time from receipt of call to dispatch . . ." does not include "stack time" (the time the call was held).
   - For other jurisdictions, "dispatch" represents the time when a responding unit has been assigned and is ready to take the call. In this instance, "Average time from receipt of call to dispatch . . ." does include stack time.

4. Interpretation of the measure "Average time from receipt of call to dispatch, for calls resulting in a dispatch" has varied slightly in the determination of which calls are included in "calls resulting in a dispatch":
   - One jurisdiction includes only E-911 calls.
   - Most jurisdictions include all calls resulting in a dispatch, which could be calls to E-911 or calls to another telephone number.

5. Variations exist in the tracking capabilities of units to arrive at "total number of incoming calls":
   - One unit is able to track all non–E-911 calls but is unable to track E-911 calls, which are transfers from another center.
   - Some units are installing a system to track the number of all incoming calls. These units have been either providing estimates or not providing the total number of incoming calls.
   - Most units have a system that tracks the number of all incoming calls.

6. Variations exist in the types of calls included in the "total number of incoming calls." These variations are due to the different functions of each emergency communications center rather than differences in interpreting the question. Some units are primary centers; others are secondary. Some transfer calls to other units of government (for example, the sheriff or Emergency Medical Services); others receive calls that were transferred from another call center.

Recommendations

1. Add the measure "Calls dispatched per telecommunicator" to correspond with the existing measure "Calls answered per telecommunicator." The dispatch function is arguably the core element of emergency communications. Inclusion of this measure would provide an additional dimension of a telecommunicator's workload.

2. Replace the measure "E-911 calls only, answered per 1,000 population" with "Calls dispatched per 1,000 population." The number of calls dispatched provides a more comprehensive base of information than the number of E-911 calls. Calls dispatched can include calls that come through both the E-911 lines and other lines.

3. Replace the measures "Cost per call answered" and "Cost per E-911 call answered" with "Cost per call dispatched." Calls dispatched provide the most meaningful basis for cost information because call dispatch is the primary function of emergency communications.

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associated with each participating jurisdiction.[7]

In December 2000 the steering committee requested a performance measurement audit for the three police functions named earlier. The purpose of the audit was to ensure that all the participating municipalities were interpreting the data requests on the service profile forms (the data collection instruments used by the project) correctly and consistently and that their processes of collecting and reporting data were not leading to a false appearance of performance deficiencies.[8] In other words, the audit should determine whether a difference in performance between one jurisdiction and another was the result of actual performance or the result of different interpretations of data requests or different processes of data collection.

Project staff conducted on-site visits during March and April 2001 to obtain information on how participating units were collecting and reporting data on patrol, investigations, and emergency communications and what their capabilities were for collecting and reporting other performance statistics. Subsequently, project staff distributed draft reports of their audit to the participating units for review and feedback. In May 2001 they held an exit conference with the steering committee to finalize the audit results and recommendations. (For an abbreviated audit report on emergency communications, see the sidebar on page 29.)

Audit Results

The North Carolina Project uses a benchmarking process that was specifically designed to collect and report accurate performance data. Much time was invested in creating service definitions, constructing detailed service profile forms, and cleaning the performance data submitted by participating jurisdictions.[9] The performance measurement audit of the three police functions provided another means to the end of accurate performance data. The audit revealed that benchmarking was working, but it also identified material differences in the performance data that were attributable to both controllable and uncontrollable factors.

Five factors were found to affect the accuracy and the comparability of performance data:

- Departmental changes
- Interpretation of definitions
- Reporting models
- Reporting capabilities
- Functional boundaries

These factors apply to systems that analyze trends or set performance targets, as well as to those that look at other jurisdictions' performance, especially in localities that collect and report data annually. The natural evolution of organizations over time requires that they periodically review the processes they use for service delivery and the performance data they gather to determine how accountable they are.

Departmental Changes

Among the many challenges that the North Carolina Project has experienced since its creation in fall 1995 is turnover of local government personnel who collect the performance data. Turnover has created difficulty with service definition, data interpretation, and data accuracy. A learning curve exists in performance measurement and benchmarking, and this creates a need for regular training of new personnel in data collection and data cleaning.

The situation has been further complicated as departments have altered their internal structures for service delivery, changing the types of data they produce and the processes by which they collect data. An example of such a change is an investment in new technology. Since the inception of the project, several jurisdictions have changed from one kind of computer-aided dispatch (CAD) system (a system for tracking dispatched calls) to another, or upgraded their existing system, and this has affected how they gather and report data. Another example is a change in organizational structure that creates processes crossing over departmental and divisional lines. Although departmental changes may cause difficulties with data accuracy, they are natural occurrences within organizations and should be accounted for in the collection of performance data.

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4. Provide clear definitions of start and end times for the measure "For calls dispatched, number of seconds from receipt of call to dispatch." Reword the measure to read "For calls dispatched, number of seconds from CAD entry to dispatch." This measure would represent the interval from when the call is first keyed into the CAD system to when the call has been assigned and dispatched to a responding unit, including stack time if necessary.

5. Regarding "calls dispatched," include self-initiated calls except for administrative events, duplicates, or calls related to another call. Also include telephone responses and walk-ins.

6. Delete the measure "Sustained complaints per 100,000 calls answered" because of variations in definitions of "sustained" and "complaint" among jurisdictions.

7. If information is available only through sampling or estimation, write "N/A" (not available) on the service profile forms.

8. When possible, report raw service data on the service profile forms, allowing project staff to calculate the performance measures.

These recommendations are summarized in Table 1.

Table 1. **Performance Measures for Emergency Communications**

Existing	Proposed
• Total calls answered per 1,000 population	• Total calls answered per 1,000 population
• E-911 calls only, answered per 1,000 population	• Calls dispatched per 1,000 population
• Calls answered per telecommunicator	• Calls answered per telecommunicator
• Cost per call answered	• Calls dispatched per telecommunicator
• Cost per E-911 call answered	• Cost per call dispatched
• For calls dispatched, number of seconds from receipt of call to dispatch	• For calls dispatched, number of seconds from CAD entry to dispatch
• Number of seconds from initial ring to answer	• Number of seconds from initial ring to answer
• Percentage of calls answered within three rings (18 seconds)	• Percentage of calls answered within three rings (18 seconds)
• Sustained complaints per 100,000 calls answered	

Epilogue

During the exit conference in May 2001, police personnel reviewed and accepted the recommendations and the proposed performance measures contained in this report, and in July 2001 the project steering committee approved them. The service profile form for emergency communications was adjusted for data collection beginning in August 2001.

Reviewing the accuracy of data is a necessary step in performance measurement and benchmarking.

Interpretation of Definitions

The audit revealed that units were providing different types of data because of differences in their interpretation of questions on the service profile forms. One of the performance measures for police investigations is "Percentage of UCR Part I crimes cleared, of those reported." Jurisdictions are supposed to provide the number of crimes reported during the fiscal year as well as the number of cases cleared. Most were providing the total number of cases cleared within the fiscal year, regardless of when the crimes were reported; however, some were providing only the number of cases cleared that were reported during the corresponding fiscal year.

Jurisdictions also varied in their determination of when "receipt of call" began and when "dispatch" occurred, for the emergency communications measure "Number of seconds from receipt of call to dispatch." One jurisdiction began tracking calls when the telephone company registered them. Others tracked calls once they were entered into the CAD system. In terms of "dispatch," some included "stack time" (the time the call was held); others did not. Interpretation of when receipt of call begins or when a dispatch occurs may result in a performance difference of only a few seconds. However, this is a critical measure for emergency communications and should be tracked in a comparable format.

Reporting Models

Each department had its own reporting models and systems to record data. Some variations existed in the way the data were captured, categorized, and reported. For the patrol performance measure "Average response time to high-priority calls," some units collected response times for all high-priority calls, including self-initiated calls, which have a response time of zero. Other jurisdictions omitted self-initiated calls, thereby increasing their average response time.

Many of the measures for patrol and investigations include the number of UCR Part I crimes that have been reported during the fiscal year. Approximately half of the departments tracked crime on the UCR model, whereas the other half tracked it using incident-based reporting.[10] These two reporting models classify crimes differently, resulting in comparability problems. As a result of the audit, project staff intend to address these differences in the narrative section of the project's annual report of performance and cost data for the participating jurisdictions.

Performance measurement represents a management tool for analyzing the operational results of local government. It provides a framework for accountability, planning and budgeting, operational improvement, program evaluation, and allocation of limited resources.

Reporting Capabilities

Some units were unable to comply fully with the information requested for particular measures, instead providing estimates based on conversions of partial-year data, subsets, or samples. The limited reporting capability of CAD and other tracking systems was the primary reason for using estimates. For example, one unit did not have a

system installed to record when incoming calls were answered. Therefore the unit conducted sampling to provide data for the measure "Percentage of incoming calls answered within three rings." Several jurisdictions now are adding, upgrading, and replacing systems, enabling them to provide complete information in the future.

Functional Boundaries

Each service area encompassed in the North Carolina Project has a corresponding service definition that describes in detail the resources and the personnel with direct involvement in that service's activities. The service definition provides the boundaries for determining the cost of a function as well as the personnel who deliver the service. The audit revealed that police departments had a clear understanding of the personnel, functions, and resources involved in emergency communications but not of those involved in patrol and investigations. Each service definition assumes that the service is a separate and distinct function with clearly identifiable personnel. The personnel and the resources being used in patrol and investigations were not completely separate. Inaccurate cost and performance data for these two services were being created as a result.

In the case of patrol, variations existed in the methodology for determining which positions to include in the number of patrol officers. Jurisdictions varied in their inclusion or exclusion of positions such as school resource officers, supervisors, traffic officers, and other special unit positions. It became evident that patrol was a complex function that could not be defined consistently across jurisdictions. Further, the duties of patrol officers were not limited to the patrol function. The multiple roles of patrol officers indicated a need for a broader service definition.

Although most departments had investigative units, people outside those units were handling a portion of the investigative work and case clearance. For example, many jurisdictions assigned certain types of crime investigations to patrol officers. Although the patrol officers and others were contributing to the investigative function, most units were excluding these costs from the total cost of police investigations.

As a result of the audit, the steering committee decided to combine the patrol and investigation functions into a broader service area. The need for accurate and comparable data was the overriding factor in this decision. It was understood that trend data and detailed measures for each functional area would be lost.

Conclusion

Performance measurement represents a management tool for analyzing the operational results of local government. It provides a framework for accountability, planning and budgeting, operational improvement, program evaluation, and allocation of limited resources.[11] Benchmarking expands the usefulness of performance measurement by providing local governments with a methodology to identify best practices for service delivery. Examples of North Carolina Project members using the performance and cost data to improve service provide evidence that benchmarking can yield tangible results.[12]

Two major components of performance measurement and benchmarking are collection of accurate and reliable performance data and use of those data to improve services or processes.[13] This article demonstrates the need for an additional component of performance measurement and benchmarking: auditing of performance data.

An aspect of benchmarking highlighted by the audit was the influence of a jurisdiction's business practices on its performance, as revealed by the selected performance measures. Although business practices do not necessarily influence the accuracy and the reliability of performance data, they affect service outcome as measured by performance statistics. Each jurisdiction makes choices in service delivery, including level of service, priorities, and procedures for providing the service. An example involves the measure "Average response time to high-priority police calls." A vehicle accident without personal injury may warrant a high-priority response in one jurisdiction. Other jurisdictions may not consider this occurrence high priority because personal injury was not present. The understanding of differences in business practices is critical to identifying best practices in a bench marking initiative for service or process improvement, and to preventing comparability problems from a limited amount of information.

The manager of Carolina City presents the newspaper article and the Carolina City police department's performance measures to senior staff, requesting that the police chief contact the Tarheel Town police department for clarification on the measures. The police chief's review reveals that the neighboring jurisdiction uses a different definition of high-priority calls, does not include telephone responses in its total dispatched calls, and uses stringent solvability factors for assigning cases to investigators.

Comparison of Performance Measures

Measure	Carolina City	Tarheel Town	Explanation of Variation
Response time to high-priority calls, in minutes	2.8	3.0	Different definitions of high-priority calls
Dispatched calls per patrol officer	155	142	Different types of calls recorded for dispatched calls
% of UCR Part I crimes cleared, of those assigned to investigators	29	55	Different methodology for assigning crimes to investigators

Involving service providers in audits of performance data is critical to success.

The police chief prepares a comparison (see page 33) and forwards it to the city manager for review.

The manager receives a number of inquiries from council members who have read the newspaper article and made their own comparisons. They are concerned about the 29 percent of UCR Part I crimes cleared, compared with Tarheel Town's rate of 55 percent. The community has experienced an increase in crime the past two years, and a low clearance rate is going to be difficult to explain to their constituents. The city manager provides an overview of the comparability problem and says that, using Tarheel Town's definitions of performance data, the police chief is calculating comparable measures for council members' review. On the basis of this experience, the city manager decides to implement an annual review of selected performance data to ensure that the three years of performance measures presented in the annual operating budget are accurate, reliable, and comparable.

Notes

1. UCR (uniform crime reporting) is a system used by law enforcement agencies to report crime at an aggregate level to the State Bureau of Investigation and the Federal Bureau of Investigation.

2. Evan Berman & XiaoHu Wang, *Performance Measurement in U.S. Counties: Capacity and Reform*, 60 PUBLIC ADMINISTRATION REVIEW 409 (Sept./Oct. 2000); Theodore H. Poister & Gregory Strieb, *Performance Measurement in Municipal Government: Assessing the State of the Practice*, 59 PUBLIC ADMINISTRATION REVIEW 325 (July/Aug. 1999).

3. SALOMON A. GUAJARDO & ROSEMARY MCDONNELL, AN ELECTED OFFICIAL'S GUIDE TO PERFORMANCE MEASUREMENT (Chicago: Gov't Finance Officers Ass'n, 2000).

4. DAVID N. AMMONS, MUNICIPAL BENCHMARKS (2d ed., Thousand Oaks, Cal.: Sage, 2001).

5. Katherine Barrett & Richard Greene, *Truth in Measurement*, 13 GOVERNING 86 (Sept. 2000).

6. The goal of an auditor is to determine if financial data are reasonable, not absolute. "Materially accurate" is an auditing term for "reasonable," representing that financial statements are fairly presented. For more information on materiality, see STEPHEN J. GAUTHIER, GOVERNMENTAL ACCOUNTING, AUDITING, AND FINANCIAL REPORTING (Chicago: Gov't Finance Officers Ass'n, 2001).

7. WILLIAM C. RIVENBARK & CARLA M. PIZZARELLA, FINAL REPORT ON CITY SERVICES FOR FISCAL YEAR 1999–2000 (Chapel Hill: Inst. of Gov't, The Univ. of N.C. at Chapel Hill, 2001).

8. For copies of the service profile forms, *see* WILLIAM C. RIVENBARK, A GUIDE TO THE NORTH CAROLINA LOCAL GOVERNMENT PERFORMANCE MEASUREMENT PROJECT (Chapel Hill: Inst. of Gov't, The Univ. of N.C. at Chapel Hill, 2001).

9. Service definitions identify the specific activities encompassed by the service as well as the resources and the personnel involved. Data cleaning involves examining the information for reasonableness, comparing it with data from previous years, and reviewing it with service and line managers.

10. Incident-based reporting is a system used by law enforcement agencies to report crime at a detailed level on the basis of data elements and values for describing each incident or arrest.

11. AMMONS, MUNICIPAL BENCHMARKS.

12. David N. Ammons, *Benchmarking as a Performance Measurement Tool: Experiences among Municipalities in North Carolina*, 12 JOURNAL OF PUBLIC BUDGETING, ACCOUNTING & FINANCIAL MANAGEMENT 106 (Spring 2000).

13. Dale R. Geiger, *Practical Issues in Level of Precision and System Complexity*, 49 GOVERNMENT ACCOUNTANTS JOURNAL 28 (Summer 2000); *Avoiding Pitfalls in Managerial Costing Implementation*, 50 JOURNAL OF GOVERNMENT FINANCIAL MANAGEMENT 27 (Spring 2001).

E-Government in Rural North Carolina

Shannon Howle Schelin

The era of e-commerce and e-procurement is here, and many citizens expect the same responsiveness from government as from the private sector. Enter e-government.

"E-government" is government use of information technology, particularly Web-based Internet applications, to enhance delivery of information and services to employees and agencies within government and to citizens and business partners. E-government focuses on centralization of public data and improvement of internal processes and communications.[1] As the twenty-first century advances, government's overwhelming interest is to use "interoperable" technologies—technologies that allow various departments to share data across information systems or products without special effort on the part of staff. Traversing all types of computer operating systems and various departments' databases has become increasingly necessary.[2] Such coordination will support greater efficiency and effectiveness and result in more citizen access.

To implement interoperable technologies, governments must address issues related to connectivity, infrastructure, hardware, and software (for definitions of these and other key terms, see the sidebar on page 36). This article describes the technologies, the personnel, and the infrastructure currently in place in rural North Carolina to support e-government.

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Background

In early 1997 the Institute of Government recognized a need to add information technology to its offerings to local governments in North Carolina. In early 2000, responding to government requests and following an in-depth analysis, the Institute established the Center for Public Technology. The purpose of the Center is to respond to local governments' needs in information technology and to increase their skills and capacity in that area.

The North Carolina General Assembly also has recognized the importance of information technology in government and in North Carolina generally. In its 2000 session, it created the Rural Internet Access Authority to oversee efforts to provide rural areas with high-speed broadband Internet access.[3] The Rural Internet Access Authority is charged with eradicating the "digital divide" in North Carolina—that is, the gap between the people who do and the people who don't have access to and the capability to use modern information technology. The Rural Internet Access Authority's main goals have been (1) to encourage the provision of local dial-up Internet access from every telephone exchange in North Carolina by August 2001, which has been achieved; and (2) to encourage the provision of high-speed Internet access at competitive prices to all North Carolinians by December 2003.

In summer 2001 the Rural Internet Access Authority commissioned a survey by the Center for Public Technology of the state's Tier 1 and 2 counties and the municipalities and the councils of government within those counties.[4] Tier 1 and 2 counties are the most and

the second-most economically distressed areas of the state, respectively, as ranked by the North Carolina Department of Commerce.[5] The purpose of the survey was to ascertain the infrastructure, the equipment, the personnel, and the applications in place in rural North Carolina to support e-government.

Methodology

The survey inquired about the number of personal computers in use; the types of Internet connections in use; the percentage of employees with personal computers and Internet and e-mail access; the types of electronic transactions, networks, and software in use; and related technology issues. Several local government officials and industry experts reviewed the survey to ensure the validity of the questions. In June 2001 the survey was mailed to the 36 Tier 1 and 2 counties, the 169 Tier 1 and 2 municipalities, and the 18 Tier 1 and 2 councils of government. To encourage participation and to ensure the accuracy of the returned data, follow-up telephone calls were made to all the units. As of August 27, 2001, more than 82 percent had responded, including 89.3 percent of the municipalities, 76.5 percent of the councils of government, and 72.2 percent of the counties.

Highlights of the Findings

Several major themes emerged from the survey data:

- Municipalities in Tier 1 and 2 counties are much more limited in infrastructure, hardware, software, and personnel capacity for information technology than are the counties in which they are located.
- The lack of internal and external information technology networks in Tier 1 and 2 municipalities and counties indicates insufficient infrastructure to support interoperable e-government initiatives.
- Tier 1 and 2 municipalities' connection to the Internet, if they have one, is primarily via a slow-speed, dial-up modem.

Each of these themes is reflected in the discussion of the issues that follows.

Population Size and Technological Sophistication

The survey data suggest that population size is an indicator of how much infrastructure, equipment, and applications each government unit has: the smaller a government unit's population, the less technologically advanced the unit is. More than 50 percent of the Tier 1 and 2 counties have populations of less than 28,000. More than 60 percent of the Tier 1 and 2 municipalities have populations of less than 1,000.

The correlation between population size and information technology is pronounced for municipalities. It is not as strong for counties, in part because they administer state and federal programs, for which hardware and software are provided or subsidized.

Number of Personal Computers

Personal computers are indispensable for access to the Internet and other technologies. However, for many units of government in economically distressed areas, such hardware is limited (see Figure 1). On average, in Tier 1 and 2 municipalities, there is one computer for every 2.6 employees. Moreover,

Key Terms

Connectivity: the ability to link to the Internet

Hardware: physical equipment (computers, monitors, keyboards, etc.) as opposed to programs, procedures, rules, and associated documentation

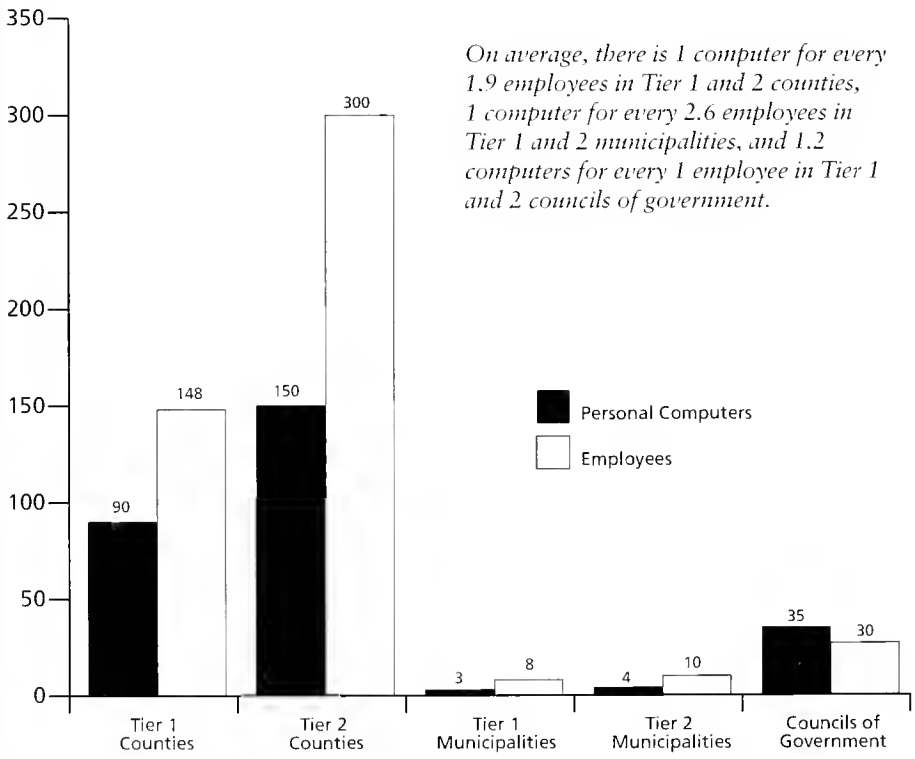
Information technology: the branch of technology devoted to study and application of data and its processing

Infrastructure: the physical components, such as physical and wireless transmission media and communication devices, used to connect computers and users

Interoperability: the ability of software and hardware on different machines from different vendors to share data

Software: a set of computer programs, procedures, and associated documentation concerned with the operation of a data processing system

Figure 1. **Average Number of Personal Computers and Employees in Tier 1 and 2 Units of Government**



On average, there is 1 computer for every 1.9 employees in Tier 1 and 2 counties, 1 computer for every 2.6 employees in Tier 1 and 2 municipalities, and 1.2 computers for every 1 employee in Tier 1 and 2 councils of government.

Table 1. **Employee Access to Personal Computers, E-Mail, and the Internet among Tier 1 and 2 Units of Government**

Unit	50% or More of Employees with Access to PCs	50% or More of Employees with Access to E-mail	50% or More of Employees with Access to Internet
Counties	25 of 26	16 of 26	18 of 26
Municipalities	104 of 150	56 of 149	55 of 148
Councils of Government	13 of 13	13 of 13	13 of 13

twenty-two of the Tier 1 and 2 municipalities have no personal computers at all.

Tier 1 and 2 counties and councils of government fare somewhat better, although some still lack enough personal computers for all their employees. Tier 1 and 2 counties average 1 computer for every 1.9 employees. In contrast, the average council of government has 1.2 personal computers for every employee.

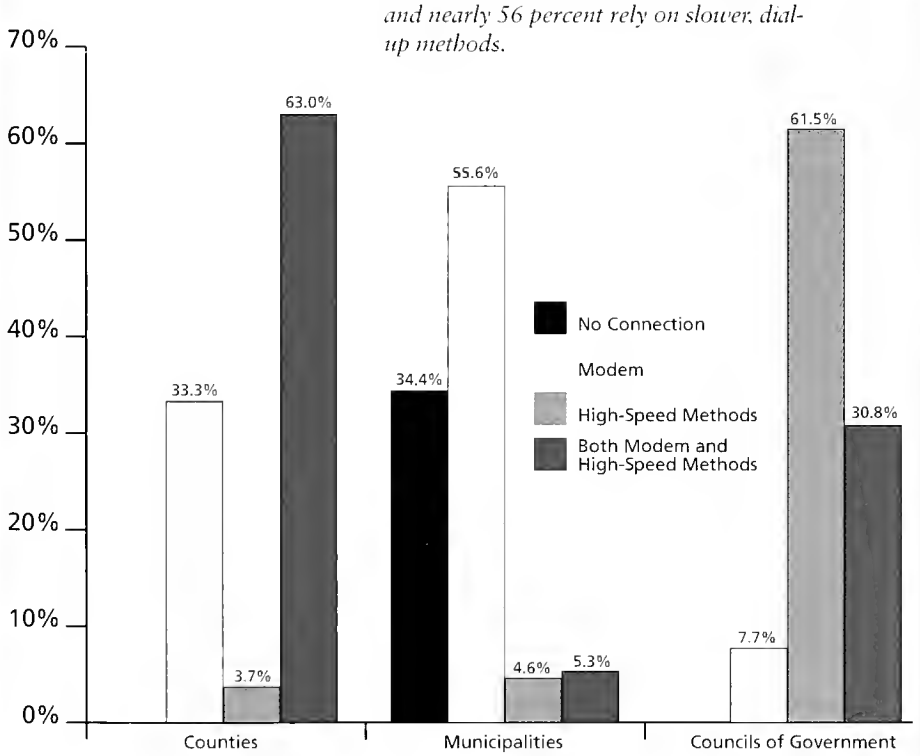
Although not all employees need a personal computer to perform their jobs, the ratio of personal computers to employees in Tier 1 and 2 municipalities and counties is clearly not optimal.

Employee Access to Personal Computers, E-Mail, and the Internet

Employee access to personal computers, e-mail, and the Internet is another critical issue as local governments attempt to move to e-government. Ninety percent of Tier 1 municipalities and 85 percent of Tier 2 municipalities report some access to personal computers for employees, but less than 60 percent of either type report access to e-mail or the Internet. All Tier 1 and 2 counties and councils of government report some access to personal computers, e-mail, or the Internet for employees. Employees of councils of government have greater access to these communication channels than employees of municipalities and counties do, with all reporting councils having at least 50 percent employee access to personal computers, e-mail, and the Internet. (For the number of units of government in which at least 50 percent of employees have access, see Table 1.)

Figure 2. **Types of Internet Connections Used by Tier 1 and 2 Units of Government**

About 34 percent of Tier 1 and 2 municipalities have no Internet connection at all, and nearly 56 percent rely on slower, dial-up methods.



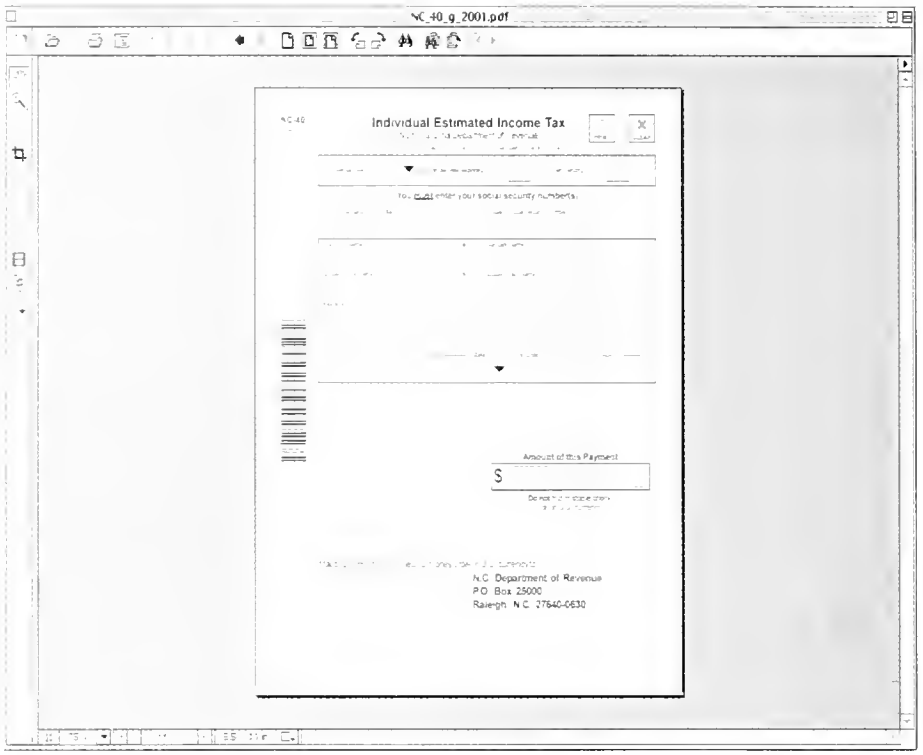
Connection to the Internet

As noted earlier, one of the primary goals of the Rural Internet Access Authority is to provide high-speed Internet connections to all North Carolinians by 2003. The value of a high-speed connection versus a standard dial-up connection is the rate of information transfer. The more quickly applications can be delivered and processed, the more they are used, and the more efficient they become. As more Web applications become available, the rate of data transfer will become increasingly important.

The survey results indicate a clear disparity between municipalities and other government units in connectivity methods (see Figure 2). About 34 percent of Tier 1 and 2 municipalities have no Internet connection at all. Among those that do have a connection, nearly 56 percent rely on slower, dial-up methods. In contrast, 63 percent of Tier 1 and 2 counties connect to the Internet via both modem and high-speed methods (meaning that they have two kinds of capabilities), and nearly 62 percent of councils of government use high-speed methods.

The larger the population of a jurisdiction, the greater the demand will be for the infrastructure necessary to support modern information technology. Therefore the larger the population, the more likely it is that private companies, such as Internet service providers and cable companies, will establish the necessary infrastructure (including cable, dark fiber, and high-speed telephone lines) for high-speed Internet connections. The survey shows a moderate correlation between population size and the

E-government offers citizens such conveniences as filing state tax forms on-line.



type of Internet connection a county has in place. There is a much stronger correlation between population size and a municipality's type of Internet connection. In essence, the smaller a municipality, the less technologically advanced its type of Internet connection.

Official Web Sites

Current literature indicates that government Web sites are necessary to encourage civic participation and to allow citizens access to government service twenty-four hours a day, seven days a week. A recent national survey found that more than 80 percent of local governments had Web sites.[6] North Carolina's Tier 1 and 2 counties and municipalities are well behind this national average, at 58 percent and 21 percent, respectively (see Figure 3). However, all the councils of government in these tiers have Web sites.

Networks

The value of interoperability and connectivity through networks is immeasurable. Networks enable the sharing of applications and data across departments, and they save money by streamlining applications and reducing data redundancy. For example, Joe Smith has lived in a town all his life but has moved three times within the town limits. The planning department, the fire department, and the tax department may have different addresses for him. With interoperable, connected systems, Joe could register his change of address with one department, and the information could be transferred to all other departments. This capability would not only lessen the burden on Joe but also reduce the workload of town staff in changing Joe's address in all the various departmental systems. Among Tier 1 and 2 units, on average, 23 percent of municipalities and 52 percent of counties currently have networks (see Figure 4). In contrast, 83 percent of councils of government have them.

Information Technology Departments

The lack of information technology departments in Tier 1 and 2 government

Figure 3. **Percentage of Tier 1 and 2 Counties and Municipalities with Official Web Sites**

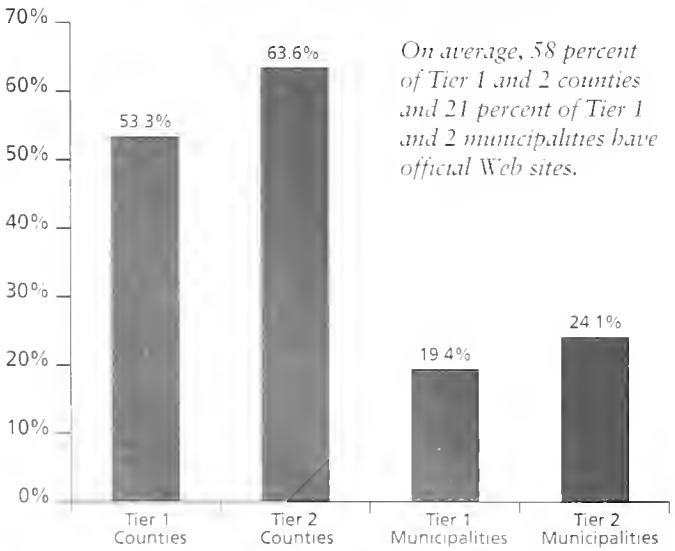
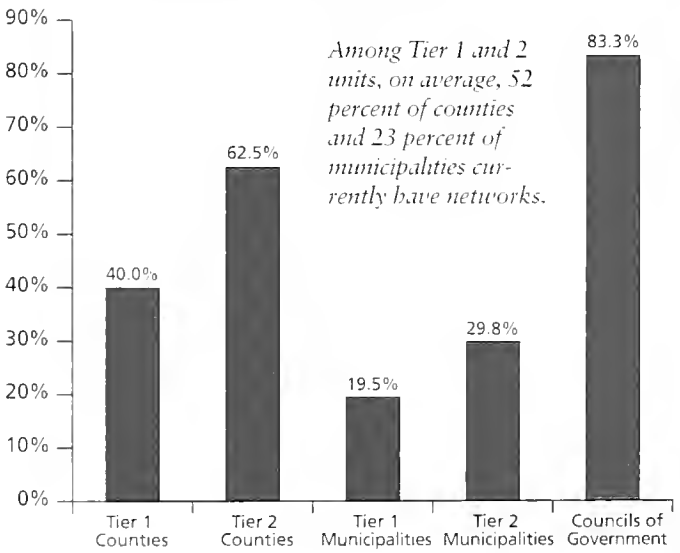
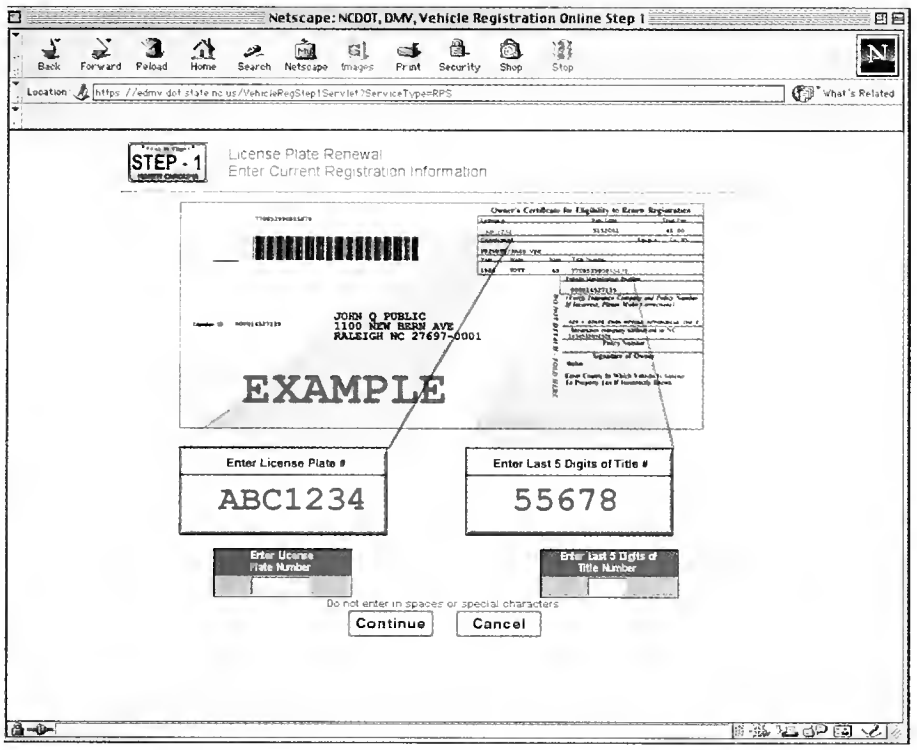


Figure 4. **Percentage of Tier 1 and 2 Units of Government with Networks**





On-line registration of vehicles is another convenience of e-government.

units is another obstacle to development and implementation of e-government initiatives. Information technology departments provide the knowledge base and the technical support to implement and maintain technology systems on a daily basis. Without dedicated information technology departments or at least trained information technology personnel, local governments will have difficulty moving forward into the era of e-government.

Ninety-six percent of Tier 1 and 93 percent of Tier 2 municipalities do not have an information technology department. Seventy-three percent of Tier 1 counties and 50 percent of Tier 2 counties do not have such a department. Further, 69 percent of the councils of government lack this kind of support. Although not all organizations need a fully dedicated information technology department, all do need at least one person trained to handle the information technology issues that will inevitably arise.

Other Barriers and Limitations

All the types of government units surveyed rank funding as the biggest hindrance to implementing e-government initiatives. The second-biggest hindrance for Tier 1 municipalities is implementation and maintenance issues, which involve both establishment of new technologies and the upkeep required to keep systems functioning at optimal levels. For Tier 2 municipalities and for councils of government, training is the second-biggest hindrance; for Tier 1 and 2 counties, lack of infrastructure.

Conclusion

Information technology is a tool for accomplishing a specific task more efficiently and effectively. It enables local government to improve interaction with and access by the public, and to streamline internal processes and communications. The advantage of using digital data, as opposed to traditional, paper-based data, is the ease of maintenance and sharing.

Implementation of e-government requires investment in information technology. It also demands that local government officials understand how to tap effectively into the services available to increase citizen interaction and streamline internal processes. The survey results reported in this article offer insights into the current status of information technology in rural North Carolina. They also provide a benchmark for measuring future progress and offer a roadmap for information technology planning and investments in local governments. The results will help the Rural Internet Access Authority determine appropriate directions for funding in order to generate high-value returns for local governments and citizens.

Notes

1. Jason H. Alexander & Joseph W. Grubbs, *Wired Government: Information Technology, External Public Organizations, and Cyberdemocracy*, 3 PUBLIC ADMINISTRATION AND MANAGEMENT: AN INTERACTIVE JOURNAL, No. 1 (1998), available at www.pamij.com/.

2. David Landsbergen, Jr., & George Walken, Jr., *Realizing the Promise: Government Information Systems and the Fourth Generation of Information Technology*, 61 PUBLIC ADMINISTRATION REVIEW 206 (2001).

3. The Rural Internet Access Authority is in the North Carolina Department of Commerce. Administrative and professional staff are provided by the North Carolina Rural Economic Development Center, a private nonprofit organization that focuses on developing, promoting, and implementing sound economic practices in rural North Carolina. The Rural Internet Access Authority is governed by a commission of twenty-one members, including employees of state government, business and education leaders, members of the Microelectronics Center of North Carolina, and representatives of the state's telecommunications companies, including Internet service providers, rural telephone cooperatives, local telephone exchange companies and independent telephone companies, commercial wireless communications carriers, and the cable industry.

4. The survey also included K–12 schools and community colleges. The results of that part of the survey are not included in this article, which focuses on government.

5. Tier 1 counties include Alleghany, Ashe, Beaufort, Bertie, Camden, Cherokee, Clay, Columbus, Edgecombe, Graham, Halifax, Hertford, Hyde, Jones, Martin, Northampton, Perquimans, Richmond, Scotland, Swain, Tyrrell, Warren, Washington, and Yancey. Tier 2 counties include Anson, Bladen, Duplin, Hoke, Madison, Mitchell, Montgomery, Onslow, Pamlico, Pasquotank, Robeson, and Vance.

6. DONALD F. NORRIS ET AL., IS YOUR LOCAL GOVERNMENT PLUGGED IN? HIGHLIGHTS OF THE 2000 ELECTRONIC GOVERNMENT SURVEY (Baltimore: International City/County Management Ass'n, Feb. 27, 2001), available at http://icma.org/download/catis/grp120/sgp224/e-gov2000.pdf.

The Truth about Cats and Dogs: Vaccinations, Licenses, Service, Revenue

Catherine M. Clark

North Carolina law authorizes local governments to collect an animal license fee on all cats and dogs living in their jurisdiction. However, data from several animal licensing programs show that large populations of cats and dogs are going unlicensed. Consequently, local governments are tapping into only a small portion of a potential revenue stream. This article suggests that, by using rabies vaccination records as the basis for a licensure database, an animal licensing program can increase the number of animals it licenses and the amount of revenue it raises from licensure. The government also can increase the number of animals vaccinated for rabies and thus improve its service to the community.

ANDREW ROSS PHOTOGRAPHY

Background

Animal services of local governments, which include control of animals, sheltering of animals, and control of rabies, may be funded through a combination of general fund appropriations, donations, fines, charges, and animal license fees. As is common with most local government services, animal services typically require increased funding each year to provide a constant level of service to a growing population. Of the revenue sources just listed, animal license fees not only are a steady and predictable income stream but also permit the program some degree of financial independence from the volatility of annual budget appropriations.[1]

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A county or a municipality may levy animal license fees at its discretion to recoup the expense of operating an animal service program.

Licensing of animals and control of rabies are two separate functions in North Carolina local government. The state has delegated responsibility for rabies control to county public health departments.[2] It expects health departments to maintain records of rabies vaccinations on the animals inoculated in their jurisdiction and to offer annual rabies clinics to encourage animal vaccination. In North Carolina, owners of domesticated cats and dogs are required to have their pets vaccinated against rabies every three years, and vaccinated pets must wear a vaccination tag on their collar. The licensed veterinarian or the certified rabies vaccinator who administers the vaccine must submit a rabies vaccination certificate to the local health department as proof of vaccination.[3]

Although the county must protect the public from rabies, all other animal services are provided as a matter of choice by each county or municipal government.[4] The animal licensing fee is an optional charge for municipal and county governments. Through the enactment of a local ordinance, local governments may require pet owners to purchase a license for each cat and dog they own.[5]

A local government has many options in designing its licensing program. For example, it may choose to do any of the following:

Table 1. **Licensure Compliance, by Jurisdiction**

Animal Licensing Jurisdiction	Number of Licensed Dogs and Cats	Number of Dogs and Cats in Jurisdiction*	Percent of Licensed Dogs and Cats
North Carolina			
Asheville†‡	951	29,272	3
Cary	6,396	39,715	16
Charlotte Metro§	33,879	252,906	13
Cumberland County‡	31,521	124,663	25
Durham County	33,920	86,810	39
Forsyth County‡	33,000	124,527	27
New Hanover County	45,000	63,530	71
Orange County¥	20,284	44,506	46
Raleigh	9,091	116,704	8
Rocky Mount‡	3,086	24,778	12
Wilson County‡	5,500	29,796	18
Out-of-State			
Fort Wayne, Ind.	12,867	86,674	15
Houston, Texas	70,000	768,906	9
King County, Wash.¥	135,906	445,598	30
Marin County, Calif.‡	20,015	101,140	20
Miami–Dade County, Fla.‡	100,000	929,365	11
San Diego County, Calif.	162,789	1,204,979	14

* These numbers are calculated from an American Veterinary Medicine Association formula for estimating pet populations using human populations in an area.

† The number of cats and dogs currently licensed is estimated from the amount of licensure revenue because the actual figure was not available.

‡ This jurisdiction licenses only dogs.

§ Charlotte licenses for itself, Huntersville, Mint Hill, and Pineville and the unincorporated areas of Mecklenburg County.

¥ The total number of dogs and cats in this jurisdiction has been adjusted to reflect that the county does not license for all the incorporated municipalities.

- Charge a lower fee for sterile animals than for fertile ones[6]
- License dogs only or both dogs and cats
- Charge different rates for dogs and cats
- Require annual renewal of licenses or impose a one-time permanent license fee
- Require that animals wear their license tags on their collar, or issue no license tags at all
- Collect license fees in the animal services office or through the local government's tax office

In brief, North Carolina's "animal control laws are permissive, giving cities and counties the authority to determine how much animal control they wish to undertake."[7] The only consistent factor is that current rabies vaccination records on all vaccinated animals must be maintained by the animal control or health department of the county in which the animal resides.

Analysis of Sample Animal Licensing Programs

Relatively few localities in North Carolina require pet licensure. I included Asheville, Cary, Charlotte, Cumberland County, Durham County, Forsyth County, New Hanover County, Orange County, Raleigh, Rocky Mount, and Wilson County in the study on which I based this article.[8] Also, I chose six renowned programs from outside North Carolina as potential benchmarks for the North Carolina programs: Fort Wayne, Indiana; Houston, Texas; King County, Washington; Marin County, California; Miami–Dade County, Florida; and San Diego County, California.[9]

To evaluate the effectiveness of licensing programs, it is necessary to determine how many animals in their jurisdiction they license and vaccinate. A formula created by the American Veterinary Medicine Association allows one to estimate the cat and dog populations in an area on the basis of the human populations there. One then can compare the estimated pet population with the number of licensed animals and vaccinated animals reported by an animal service program. On average, the programs in North Carolina license 25 percent of the animals estimated to be living in their jurisdictions (see Table 1). The out-of-state programs, with an average licensure rate of 16.5 percent, appear to perform similarly to the North Carolina programs. However, the animal populations in those areas are, on average, about 400 percent larger than those in the North Carolina jurisdictions.[10] As for rabies vaccinations, on average, the North Carolina jurisdictions vaccinate 48 percent of cats and dogs in their jurisdictions (see Table 2, page 42).[11] Data on rabies vaccinations for five of the six out-of-state programs studied were not available, so no comparison is possible.

Regarding revenue collection, out-of-state programs significantly outperform North Carolina programs in supporting their budget with license fees. For out-of-state programs, revenue from licensure covers nearly 40 percent of a program's expenditures, on average. In North Carolina, revenue from licensure accounts for less than 20 percent (see Table 3, page 45).

Strategy to Increase Animal Licensing

Most operators of animal licensing programs are aware that large numbers of unlicensed animals live in their jurisdictions. However, they struggle with how to increase compliance with licensure requirements. On the basis of my analysis of the animal programs in this

Table 2. **Vaccination Compliance, by Jurisdiction**

Animal Licensing Jurisdiction	Number of Vaccinated Dogs and Cats	Number of Dogs and Cats in Jurisdiction*	Percent of Vaccinated Dogs and Cats
North Carolina			
Asheville	NA	29,272	—
Cary†	11,607	39,715	29
Charlotte Metro†	125,459	252,906	50
Cumberland County	NA	124,663	—
Durham County	46,000	86,810	53
Forsyth County	35,000	124,527	28
New Hanover County	52,590	63,530	83
Orange County	28,111	44,506	63
Raleigh†	34,108	116,704	29
Rocky Mount	NA	24,778	—
Wilson County	NA	29,796	—
Out-of-State			
Fort Wayne, Ind.	NA	86,674	—
Houston, Texas	NA	768,906	—
King County, Wash.	NA	445,598	—
Marin County, Calif.	NA	101,140	—
Miami–Dade County, Fla.	300,000	929,365	32
San Diego County, Calif.	NA	1,204,979	—

NA = not available

* These numbers are calculated from an American Veterinary Medicine Association formula for estimating pet populations using human populations in an area.

† The number of dogs and cats with rabies vaccinations was estimated from county rabies data and set in proportion to the human population

study, I recommend a three-step strategy to build a more effective licensing program:

1. Link rabies and licensure records in a database
2. Increase the number of animals vaccinated for rabies
3. Enforce the licensure requirement

The key to this strategy is the use of rabies records to target the population of pet owners. Rabies records should form the basis of the licensing program because they are the most accurate, current, and comprehensive listing of animals living within a local jurisdiction. In the North Carolina animal licensing programs discussed in this article, almost twice as many animals are vaccinated as are licensed. The reason for the higher vaccination rate may be the state's legal requirement for rabies vaccinations or widespread knowledge of the health threats that rabies presents.

Step 1: Link rabies and licensure records in a database

Licensing requires both operating a licensing program and contacting the pet-owning public. An animal control program should consider the size of the population it serves, its current financial situation, its current information management system, and the availability of staff in making decisions about licensing methods.

Formulate program features: The first question to address is whether to license both dogs and cats. All the programs in this study license dogs, but only 60 percent license cats (see Table 4, page 46). The pet population statistics of the American Veterinary Medicine Association show that there are more cats than dogs in any given area.[12] Therefore, animal programs are losing more than half of their potential revenue by licensing dogs only. Many localities do not license cats because of great resistance from cat owners.[13] However, cats contribute to both pet overpopulation and the expense of animal shelters, and cat owners can benefit from the pet-identification and other services that licensure offers.

A second question is what the license fees should be. Among all the programs in this study, the average one-year license fees are $7.45 for sterile dogs, $19.85 for fertile dogs, $8.00 for sterile cats, and $22.25 for fertile cats (for the fees of each jurisdiction, see Table 4). The fees should be kept as low as possible so as not to deter pet owners from licensing their pets because of the expense. All local governments should offer waivers of the fees for citizens of low income, senior citizens, and citizens with special needs. Also, local governments should market licensing as a service with special benefits for pet owners who have complied with the licensure requirement, such as waivers of impoundment fees (for a discussion of this and other tools for implementing a licensing program, see the sidebar, opposite).

A third question to address is whether to operate the licensing program in-house or by contract with a private firm. Animal licensing programs should consider which of these options would be more cost-effective. Although in-house licensing may bring in more net revenues, many programs do not have the resources to make the initial investment in computer software and hardware, staff salaries and benefits, training and computer support, and supplies. Contracting licensure out has none of these expenses, but it may be accompanied by difficulties in record sharing and reduced net revenues due to payment to the contractor. (For a more detailed discussion of the issues involved, see the sidebar on page 44.)

Create a database: Animal licensing programs wishing to cross-reference vaccination and licensure data have the

General Tools for Animal Service Programs

The following tools are currently used by animal licensing programs in this study. Any animal service program can adopt these tools to improve its quality, regardless of the use of animal licensure. The most important factor in evaluating the tools is to find those that are best suited to your area, the size of your pet population, your budget, and the priorities of your governing board.

Don't charge a tax; sell a service: If you choose to implement an animal license fee, make a commitment to provide desired services in return. For example, use the revenue to buy software and equipment that will allow pet owners to use the Internet to search pictures of lost animals at the local shelter. Waive the impoundment fee the first time an animal with a valid license is picked up by animal control. Return lost pets with valid licenses to their homes if they are picked up in the neighborhood instead of taking them to the pound. Wait a minimum of three weeks before euthanizing animals with valid licenses, or adopt a no-euthanization policy.

Change your name: Share your attitude about animal services by adopting a friendly program name. Many animal programs in North Carolina simply carry a name like Carolina County Animal Control. A better option might be Carolina County Animal Care and Control.

Incorporate new technology: Telephone and computer systems are more convenient than the mail for many pet owners today. Allow pet owners to use the Web or an automated telephone system to renew their licenses. Post a downloadable license application form on your Web site. Make your Web page friendly and welcoming with information about your program and also with information of interest to pet owners. (For information and suggestions on Web site creation, visit the Web site of the Humane Society of the United States, www.hsus.org/programs/companion/animal_sheltering/currentissue/may_jun99/feature_article4.html.)

Use local government ordinances: An ordinance is your legal authority to enforce compliance and to gain buy-in from management and elected officials. Ordinances should thoroughly address all aspects of the locality's animal services, including fines, licensure, shelters, and dog seizure. They also can be used to convey the general philosophy of the program. An example from Charlotte is this statement: "Escalating fees and other sanctions are measures that have been adopted to protect the citizens of Charlotte and to declare that the ownership of dogs entails publicly related responsibilities."[1] Many local governments also choose to specify in the ordinance that licensure revenue be used to support the expenses of animal service operations.

Do not use a tax collection or revenue office: A tax collection or revenue office may not be the ideal unit to collect animal license fees. Many tax collection and revenue officers confide that their staff's time is better spent following up on unpaid property taxes and other sources of revenue that are more significant in size than animal license fees. Also, in most jurisdictions that use the tax office to collect license fees, the data on licensing are on the property tax form and are slow to be disseminated to the animal licensing program because of the large number of tax payments received at the beginning of each tax year. If an animal licensing program is unable to collect and manage animal license fees, it may wish to investigate contracting options.

Use a rabies tag or a microchip in place of a license tag: Many programs in this study did not advocate the use of a separate license tag for two reasons. First, very few owners actually attach it to the pet's collar once received. Second, the envelopes, postage, and labor to send the tags are very expensive. Orange County stopped mailing tags because it cost the county $12,000 annually for fewer than 30,000 tags.

Instead of a license tag, animal programs recommend either using just the rabies tag or implanting microchips in animals. A rabies tag number can easily serve as a pet's license tag number. Because animals are required by law to wear a tag showing a current rabies vaccination, there is a greater chance that these tags will be displayed on the animal. The animal control agency can quickly identify the owner of a lost pet if all rabies records are kept in a database.

Implanting microchips in animals also is becoming a common practice. This new technology allows any agency equipped with microchip-reading equipment to access an animal's records without the need of a license or rabies tag number. Microchips permit animal control officers to identify immediately the animal they pick up, and return it to the owner while they are still in the vicinity. Marin County, California, currently uses microchips instead of tags. Many programs, such as the one in Asheville, put microchips in all the animals adopted from the animal shelter for free. Microchips are a great compromise with the cat-owning community. Many owners refuse to license their cats, arguing that they cannot make a cat wear a collar or a license; microchips are easily implanted in any dog or cat.

Stagger license renewals by month: Some animal licensing programs bill owners once a year for license renewal, all at the same time. Others bill one fourth of owners, say, in March, another fourth in June, another fourth in September, and the last fourth in December. Many animal programs strongly advise that programs billing this way switch to a monthly schedule. Renewal would then occur on the anniversary of the animal's rabies vaccination or birth month. This schedule allows the program to process the incoming payments in a timely fashion.

Offer multiple-year renewals: Allow pet owners to renew licenses for one, two, or three years at a time. Staff in Marin County, California, believe that multiyear licensing has increased the county's revenues and number of licensed animals because pet owners tend not to renew with just the one-year licensing option.

Note

1. City of Charlotte Municipal Code ch. 3, art. II, § 3-9(a6).

option of designing and building a custom program or purchasing an existing software program.[14] Before investing in software, the licensing program should take into consideration the number of records that it will manage, the hardware available, and the cost of the software. Some software programs are not able to manage large amounts of data effectively, and others may require more memory and faster operating systems than are available to the licensing program. Also, the cost of the software, installation of it, and training and support to use it may deter some animal licensing programs from making this investment.

Obtain rabies records: Because each locality operates its animal licensing program autonomously, gaining access to records is likely to be the most difficult task in implementing step 1 for counties and municipalities alike. Veterinarians do not always comply with the state law requiring them to submit rabies records to the designated county program. In these situations, staff of animal licensing programs should use the list of state-issued rabies tags to identify the veterinarians from whom rabies certificates have not been received. They then can ask the county attorney to write a letter making the veterinarians aware of the requirement. Many veterinarians have expressed concern about releasing the names of their clients. Staff of animal licensing programs should reassure them that rabies records may not be used for commercial purposes.[15]

For municipalities in North Carolina, obtaining rabies records poses even greater difficulties than for counties because they have no legal right to the information.[16] Municipalities must find a way to work with the county animal control department to get the records. Arrangements might include operating under an interlocal agreement for animal licensure, sharing the expense of data entry, or distributing rabies certifi-

Operating Animal Licensure in House or by Contract

Operating a licensure program requires that an animal services program perform many functions, including entering data, generating bills and notices, mailing licenses and notices, depositing payments, and keeping books. These tasks, particularly entering data and mailing items, are not only expensive to perform but also very time- and staff-intensive.

Andrew Ross Photography

A dog receives a microchip.

If a program opts to perform all these tasks in house, there are two important factors to consider regarding operations: additional staffing needs and recurring annual expenses. In-house licensing requires that several staff members devote their time solely to data entry and mailings. As the licensing program expands and the need for data management grows, more of these personnel will be needed. Recurring annual expenses, such as those for database training, computer upgrades and maintenance, supplies, mailing materials, and postage, often are left out or underestimated in budget projections. One-time expenses, recurring annual expenses, and revenues should all be carefully estimated for accurate reporting to management.

Some programs may prefer to contract out part or all of their operations. Contracting for printing and mailing, for example, may reduce costs and staff time because aside from data entry, printing and mailing are likely to be the most expensive and time-consuming tasks of animal licensure. By contracting with a private firm to print and mail license-related materials, an animal licensing program can reduce its labor costs and take advantage of bulk-rate savings for supplies and postage.[1]

For other animal licensing programs, the expense or the demands of in-house licensure may require that the program contract for the complete operation. For example, Petdata is a private firm that specializes in handling animal licensure operations for local governments.[2] In exchange for a portion of licensure fee revenue, Petdata will perform all data entry, printing and mailing, and fee collection.[3]

However, there are several factors to consider before contracting out the operation. First, complications may arise with gaining access to rabies records. For example, it may be difficult for a municipality to get the county to release the respective rabies certificates to a private contractor.[4] Second, the local government must decide whether its net revenues will be greater by contracting all operations out or performing them in house. The amount retained by the contractor depends on the number of licenses paid, the rate set for the license fee, and the total amount of fees collected.[5] Finally, local governments must account for the expenses related to contract management. Net revenues for contracted operations should reflect this cost.

Notes

1. Orange County currently contracts for all its printing and mailing with a company in Fayetteville. The county compiles all the data for new and renewal notices and electronically downloads the information to the contracted company. The company then prints and mails bills for new licenses, renewals, and delinquent accounts. Orange County's expenditures for printing and mailing have been reduced from 10 cents per piece of mail to 5 cents by contracting these tasks out. The animal licensing program now spends less than $12,000 annually for all its license-related mailings.

2. For more information on Petdata, visit www.petdata.com.

3. Petdata staff would not release the average amount that the firm retains per paid license but did say that in the case of Raleigh, it was less than 50 percent of the license fee.

4. Before making a firm agreement with a contractor, the municipality will want to negotiate an agreeable arrangement with the county—for example, that it will bear the expense of data entry for all the records if the county will release them.

5. Petdata targets animal licensing programs serving human populations of more than 100,000 because the corresponding number of licenses maximizes the revenue of both Petdata and the animal program.

Table 3. **Revenue Collected, by Jurisdiction**

Animal Licensing Jurisdiction	Animal Services Budget for FY 2000*	Revenue from Licensure for FY 2000	% of Budget Supported by License Fees
North Carolina			
Asheville†	$ 980,023.52	$ 9,511.62	1
Cary	125,000.00	4,250.00	3
Charlotte Metro	4,200,000.00	391,477.50	9
Cumberland County	542,444.60	153,494.00	28
Durham County	975,775.00	258,658.00	27
Forsyth County	1,017,227.00	249,294.00	25
New Hanover County	474,000.00	235,000.00	50
Orange County	744,001.00	108,000.00	15
Raleigh	600,000.00	69,146.00	12
Rocky Mount	112,900.00	30,860.00	27
Wilson County	247,089.75	16,500.00	7
Out-of-State			
Fort Wayne, Ind.	$1,299,707.00	$64,402.00	5
Houston, Texas	3,200,000.00	599,995.00	19
King County, Wash.	2,699,037.00	2,202,562.00	82
Marin County, Calif.	1,817,455.00	200,392.50	11
Miami–Dade County, Fla.	4,400,000.00	3,400,000.00	77
San Diego County, Calif.	8,044,493.00	2,910,946.00	36

* The large discrepancies among budget figures reflect the variety of programs and services provided by each jurisdiction. Program expenditures may include any combination of animal shelter and animal control costs, including personnel, equipment, and overhead.

† The revenues are low because the licensing program is in its first year

cates to the locality that would do the licensing (rather than keeping them all in the county office).[17] Although pet owners can be reached without rabies records, methods that would produce good results, such as door-to-door canvassing and mass mailings, are very expensive given the expected return in revenue.

Obtain licensure records: Animal licensure records also may be difficult to obtain, depending on the method the locality uses to collect the related revenue. Many localities collect animal license fees through their tax collection or revenue office. In these cases, licensure records may not be easily separated from property tax records or may not be available in an electronic format that will easily link them to rabies records. Ideally, licensure records are handled by the animal licensing program and are separate from any other fee or tax documents (for more information on independent handling of licensure records by animal services programs, see the sidebar, opposite).

Step 2: Increase the number of animals vaccinated for rabies

The challenge in increasing the number of animals vaccinated is to reach pet owners and educate them about the need for vaccination. Information from the programs in this study indicates that the most successful methods for increasing vaccinations are low-cost rabies clinics and media campaigns. Canvassing and traveling neighborhood clinics, although more expensive, also are used by some localities.

Conduct clinics or other events: Low-cost rabies vaccination clinics are particularly effective at reaching pet owners. State law mandates that the county agency responsible for animal control host one rabies clinic each year. Forsyth County has had great success at increasing the number of vaccinated animals by hosting two low-cost rabies clinics per year at its animal shelter. The county sets up computers in the shelter and immediately enters the new records into its database. These clinics increase the county's vaccinated animal population by 400 to 700 pets annually.

Increase public awareness of rabies vaccination requirements: Government-sponsored clinics are successful in part because the local government uses the media to inform citizens. Pet owners are not always aware that state law requires their pets to be vaccinated and receive regular rabies boosters. Many will vaccinate their pets only on announcement of a rabid-animal sighting.[18] Owners of pets that stay indoors often do not maintain regular vaccinations because they do not think that their pets can be infected. Animal licensing programs should use television, radio, and newspapers both to educate pet owners on the threat of rabies and to announce rabies clinics as easy opportunities to get pets vaccinated.

Canvassing and neighborhood rabies clinics also increase the number of vaccinated pets. Canvassing requires sending animal control officers and other staff door-to-door to check for current rabies tags. Some jurisdictions announce in advance the dates that they expect to canvass a neighborhood, giving pet owners an opportunity to vaccinate their pets before the arrival of the canvassing team. Other jurisdictions send their canvassing teams out unannounced but use the opportunity to check animals and offer rabies education to pet owners. Owners with animals that are not current on their vaccinations are given a few weeks to comply before a citation is issued. One drawback to canvassing is that it is an expensive investment in time and personnel.

Neighborhood vaccination clinics are a successful way to reach out to smaller groups of pet owners. These clinics involve a vehicle equipped with the necessary vaccination supplies traveling to different areas of the jurisdiction to administer vaccinations on site. However, these clinics must be

Table 4. **Animal License Fees, by Jurisdiction**

Animal Licensing Jurisdiction	Dog		Cat	
	Sterile	Fertile	Sterile	Fertile
North Carolina				
Asheville	$5.00	$15.00	—	—
Cary*	10.00	20.00	$10.00	$20.00
Charlotte Metro	7.50	25.00	7.50	25.00
Cumberland County	7.00	15.00	—	—
Durham County	5.00	25.00	5.00	25.00
Forsyth County	5.00	25.00	—	—
New Hanover County	9.00	18.00	9.00	18.00
Orange County	5.00	10.00	5.00	10.00
Carrboro†	8.00	15.00	8.00	15.00
Chapel Hill†	8.00	15.00	5.00	10.00
Chapel Hill annex in Durham†	3.00	5.00	—	—
Raleigh	7.00	14.00	7.00	14.00
Rocky Mount	10.00	10.00	—	—
Wilson County	3.00	3.00	—	—
Out-of-State				
Fort Wayne, Ind.	$4.00	$25.00	$4.00	$25.00
Houston, Texas‡	10.00, 2.00	25.00	10.00, 2.00	25.00
King County, Wash.§	15.00	55.00	15.00	55.00
Marin County, Calif.*	7.00, 13.00, 18.00	20.00, 39.00, 57.00	—	—
Miami–Dade County, Fla.	20.00	32.00	—	—
San Diego County, Calif.*	10.00, 17.00, 23.00	25.00, 41.00, 53.00	10.00, 17.00, 23.00	25.00, 41.00, 53.00

Note: All fees are for one year unless otherwise noted.

* These are one-time fees. Cary's licenses are permanent; there is no renewal involved.

† Orange County issues licenses for this municipality, but it sets its own fee schedule.

‡ For sterile pets, Houston charges $10.00 for the first license, $2.00 for the annual renewals.

§ King County's $55.00 fee for a fertile animal includes a $25.00 voucher for a spaying or a neutering.

* Fees represent one-, two-, and three-year licenses.

announced in advance to ensure maximum turnout. Traveling clinics may be the best option to serve neighborhoods identified by canvassing teams as having high numbers of unvaccinated animals.

Step 3: Enforce the licensure requirement

With a well-established base of rabies records, the final step is to license the identified animals and promote the licensing program to the public.

License vaccinated animals: Matching vaccination and licensure records will reveal pet owners who are not in compliance with licensure requirements, either because they have not renewed their animal's license or because they have vaccinated their animal but not licensed it. Program staff can generate appropriate notices on the basis of the matching and mail them to owners.

Increase public awareness of the licensure program: Just as with rabies vaccinations, pet owners must be informed of the requirements for animal licensure. Whereas some pet owners simply neglect to vaccinate their pets, many are completely unaware of their responsibility to license their pets. All the methods previously mentioned for increasing the number of rabies vaccinations also can increase licensure. Many animal licensing programs offer both vaccinations and licenses at their rabies clinics. Others host special events just for licensing. For example, the Humane Society of Marin County, California, hosts Be Kind to Animals Week, during which it waives late fees for owners who have not complied with licensing requirements. Several other programs offer similar amnesty opportunities for noncompliant pet owners.

Canvassing and media campaigns also can be used to increase licensure. By going door-to-door, animal control teams are able to check for rabies vaccinations and inform pet owners of their requirement to license. Many programs collect completed license applications and fees while canvassing neighborhoods. Media announcements can be used to inform large numbers of citizens about licensure requirements. Cary, North Carolina, spent several weeks advertising its new requirement for cat licensure. When the date requiring licenses for cats had passed, not only had many pet owners licensed their cats, but the number of licensed dogs had actually doubled. By simply informing the pet-owning public of the licensure requirement, Cary was successful in increasing the number of licensed pets.

Partner with veterinarians: Veterinarians should be included in the effort to increase licensure. Not only can their participation increase the number of licenses, but it also can improve relations between them and the local government. Animal licensing programs should offer incentives to veterinarians for their participation. For example, Marin County, California, creates information packets and distributes them to area veterinarians. The veterinarians receive $2 for any paid license application picked up from their office.[19] Wake County Animal Control provides its veterinarians with free rabies tags each month. This practice has the added benefit of allowing program staff to communicate regularly with veterinarians. San Diego County, California, advertises the names and the locations of cooperating veterinarians on its Web site and refers pet owners to these veterinarians through the mail or over the telephone.

Conclusion

Animal licensing programs in North Carolina have yet to reach their maximum revenue potential. By increasing the number of licensed animals through the use of rabies records, these programs will increase the number of licensed and vaccinated pets in their jurisdictions, improve their service to the community, and increase their revenues.

The recommendations offered in this article must be adapted to fit animal licensing operations for each program. Variations will be necessary depending on the services a program provides, the size of the pet population, the size of the annual budget, and the sentiment of pet owners.

Notes

1. Revenues from animal taxes are typically included in a local government's general fund unless the governing body enacts an ordinance to dedicate the revenues to the animal services department. (For the use of local government ordinances for this purpose, see the sidebar on page 43.)

2. The responsibility for rabies monitoring and control may be placed in another department if the animal control program is not housed in the health department. For example, in Wake County, rabies control falls under the Animal Control Division of the Department of Environmental Services.

3. N.C. GEN. STAT. § 130A-189 (hereinafter G.S.).

4. Although a county and each incorporated municipality within it may all operate separate animal programs, a locality often enters into an interlocal agreement with another locality to provide joint services. Interlocal agreements are most common with animal licensure and animal sheltering. Animal control functions, such as abating animal nuisances and responding to calls about vicious animals, often are handled separately by each local government's animal control office or law enforcement office.

5. G.S. Chs. 153A and 160A authorize local governments to create ordinances for their jurisdiction on any number of matters, including animal abuse, dangerous animals, animal license fees, animal shelters, and contracts for animal services.

6. Setting separate fees for sterile and fertile animals is called "differential licensing." Localities may choose this option to encourage owners to spay or neuter their pets.

7. BEN F. LOEB, JR., ANIMAL CONTROL LAW FOR NORTH CAROLINA LOCAL GOVERNMENTS 5 (Chapel Hill: Inst. of Gov't, The Univ. of N.C. at Chapel Hill, 1997).

8. Several of these localities have entered into interlocal agreements to serve the area. For example, Charlotte operates the animal control program for Huntersville, Mint Hill, Pineville, and the unincorporated areas of Mecklenburg County. Durham County Animal Control serves both Durham city and the unincorporated areas of the county. Carrboro and Chapel Hill contract with Orange County for animal control services. Hillsborough does not because it does not have an animal licensure ordinance.

9. The American Humane Association recommended these localities as having exemplary animal licensure programs. The association also recommended the programs operated by Palm Beach County, Florida; Pittsburgh; and San Mateo County, California. However, these localities were not able to provide the necessary data for inclusion in this study.

10. Of the programs in this study, the average North Carolina program licenses 20,239 animals, whereas the average out-of-state program licenses 83,596 animals.

11. Four North Carolina programs were unable to provide rabies data and are not included in the reported statistics.

12. Statistics of the American Veterinary Medicine Association (available at www.avma.org/cim/estimate.htm) indicate that 53 percent of households own dogs, and 60 percent cats.

13. These owners argue that license revenues are used disproportionately to support dog operations, including dog control, nuisance complaints, and dog sheltering. They also contend that cats should be able to roam freely and cannot be expected to wear a license tag.

14. For a review of current software options, *see Finding Software for Your Shelter,* ANIMAL SHELTERING, May/June 2000, p. 24. It can be ordered from the Humane Society of the United States or downloaded from the society's Web site, www.animalsheltering.org.

15. Under G.S. 130A-189 it is not a violation of the law for a county to provide rabies data to a municipality, a nonprofit, or a contracted company to use for licensure, "provided that the information . . . will not be used for commercial purposes."

16. Under G.S. 130A-189, rabies records are sent "to the county agency responsible for animal control."

17. This study found no licensing programs that shared or distributed rabies vaccination records except those participating in interlocal agreements.

18. As the Orange County animal control director pointed out, rabies vaccinations soar at the announcement of a rabid-animal sighting and fall in the absence of any publicity about rabies.

19. Although some programs allow veterinarians to collect license fees on the animals they serve, several programs report that they have found it difficult to manage the arrangement and collect the fees. This relationship is not recommended.

Ammons Appointed to Lead MPA Program

Former Director Allred Moves to Associate Provost Position

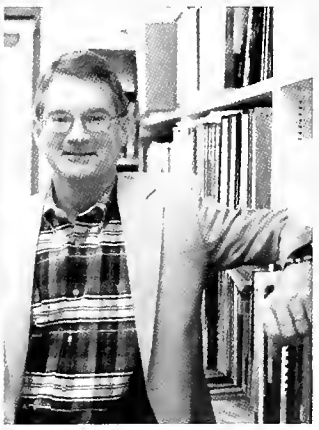
In September 2001, Professor David N. Ammons, a specialist in local government productivity, was appointed to a five-year term as director of The University of North Carolina at Chapel Hill's Master of Public Administration (MPA) Program. The program is housed in the School of Government.

In making the appointment, Michael R. Smith, dean of the school, said Ammons "is recognized nationally as a leader in the field of public administration and is deeply committed to maintaining and enhancing the academic excellence and reputation of the MPA Program."

Ammons replaces Professor Stephen Allred, program director since 1995 and a School of Government faculty member since 1986. Allred recently was appointed associate provost of UNC–Chapel Hill.

Ammons's primary focus is local government performance measurement, benchmarking, and productivity improvement. He is the author of several books, including the 2001 release *Municipal Benchmarks: Assessing Local Performance and Establishing Community Standards* (Sage Publications).

Ammons has served in various


JON GARDINER

New MPA Program Director David Ammons

About the MPA Program

The two-year MPA Program serves about forty full-time students each year, preparing them for leadership in local, state, and federal government and nonprofit organizations. Started in 1966, the program has long been recognized as providing outstanding public administration scholarship with a pragmatic focus. Accredited by the National Association of Schools of Public Affairs and Administration, it is consistently ranked highly by *U.S. News and World Report.*

administrative capacities in the municipal governments of Hurst and Fort Worth, Texas; Phoenix, Arizona; and Oak Ridge, Tennessee. He holds a Ph.D. in political science, with a concentration in public administration, from the University of Oklahoma and an MPA from Texas Christian University. Ammons taught in the public administration programs at the University of Georgia and the University of North Texas before joining the Institute in 1996.

In assuming leadership of the MPA Program, Ammons noted that the quality of the students and the strong alumni network, which "few other programs, if any, can match," have impressed him. He also considers the program's location in the School of Government to be a major advantage. Students benefit from direct experience working with faculty on some of the newest research in public administration and related fields. "Many of the plum assignments are handled by MPA students, making the educational experience a very practical one," Ammons remarked.

Of his predecessor, colleague, and friend, Ammons said, "Steve did a great job as MPA director. I hope we can build on his work and enjoy additional accomplishments for the program in the future."

According to Allred, the associate provost position was too rare an opportunity to pass up. "There are few times when you have the chance to do something you really believe in, on a scale that will really make a difference," he said. A respected educator in public personnel law and the recipient in 2000 of the Albert and Gladys Hall Coates Term Professorship for Teaching Excellence, Allred will maintain his connection with the School of Government and the MPA Program by continuing to teach a first-year personnel law course.

Juffras to Teach Employment Law

Diane M. Juffras joined the faculty of the School of Government in September 2001 as an assistant professor. She will focus on employment law, employment discrimination law, and relations between governmental employer and employee.

Juffras has broad experience dealing with workplace policy and termination issues, wage and hour law, the Family and Medical Leave Act, the Americans with Disabilities Act, and the Older Workers Benefit Protection Act. She spent the last several years in private law practice in Connecticut. Although noting significant differences between private practice and public service, she expects to draw on her diverse legal experience in intellectual property, e-commerce, health care, and business law to add depth to her teaching and consultations.

A lawyer with a Ph.D. in classics, Juffras has taught in the classics departments of Ohio State University, Princeton University, and the University of Virginia. She earned her undergraduate degree from Dartmouth (where she was elected to Phi Beta Kappa), her Ph.D. from the University of Michigan, and her J.D. from the New York University School of Law. She is married to UNC–Chapel Hill classics professor Jim O'Hara and has a four-year-old daughter.

JON GARDINER

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Wall Joins Public Health Law Faculty

Aimee N. Wall, an attorney specializing in public health law, joined the School of Government faculty in July 2001 as an assistant professor. She will cover a broad array of public health issues and subjects, including privacy of health information, environmental health, smoking regulation, local boards of health, and health department services.

Before joining the school faculty, she worked in health law with the Washington, D.C., firm of Powell, Goldstein, Frazer, & Murphy. She also participated in the prestigious Presidential Management Intern program, where she worked in the Office of the Assistant Secretary for Planning and Evaluation and the Health Care Financing Administration of the U.S. Department of Health and Human Services. Her work for the department included drafting regulations, briefing congressional staff, and performing data analysis. In North Carolina, Wall interned with the N.C. Health Access Coalition during implementation of the state's Children's Health Insurance Program.

Wall received her J.D. in 1997, with honors, from the UNC–Chapel Hill School of Law and earned an MPH from the School of Public Health the following year as part of a joint degree program. An Ohio native and a Phi Beta Kappa graduate of Ohio State University, she is married to Steve Wall.

—Ann C. Simpson

Off the Press

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David W. Owens
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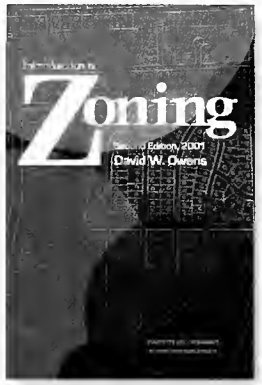

Municipal Benchmarks: Assessing Local Performance and Establishing Community Standards

David N. Ammons
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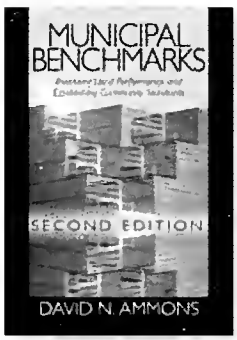

Provides municipal officials and citizens with the practical tools needed to establish and assess community standards for operation and delivery of community services. Explores the design of useful performance measurement systems, the improvement of existing systems, and the establishment of local performance standards. Offers benchmarks against which a municipality's performance may be assessed and presents relevant national standards developed by professional associations, as well as actual performance targets and results.

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Joseph S. Ferrell
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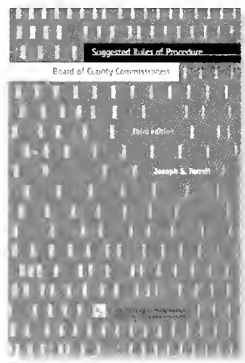

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